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UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Apr. 13, 1984.

Board of Appeals Decisions Rendered in the Month of July 1984

Affirmed	184
Affirmed in Part	37
Reversed	80
Total	301

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,274,141, Re. S.N. 505,364, Filed June 16, 1983, Cl. 364/431, METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE, PARTICULARLY THE STARTING UP OF THE ENGINE, Hiroastu Tokuda, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 237

4,305,625, Re. S.N. 543,133, Filed Oct. 16, 1983, Cl. 235/152, DRAWER SLIDE ASSEMBLY, Kenneth H. Gutner, et al., Owner of Record: *Kenneth H. Gutner, Highland Park, Ill.,* Attorney or Agent: Timothy L. Tilton, et al., Ex. Gp.: 214

4,373,104, Re. S.N. 524,023, Filed Aug. 17, 1983, Cl. 546/145, SULFUR-CONTAINING ISOQUINOLINE DERIVATIVES PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM, Kalman Takacs, et al., Owner of Record: *Inventor,* Attorney or Agent: Herbert Dubno, et al., Ex. Gp.: 122

4,373,505, Re. S.N. 607,925, Filed May 7, 1984, Cl. 126/39E, ADJUSTABLE VENTURI TUBE ASSEMBLY FOR A GAS BARBECUE GRILL, Walter Koziol, Owner of Record: *Modern Home Products Corp., Antioch, Ill.,* Attorney or Agent: Neil E. Hamilton, et al., Ex. Gp.: 345

4,395,706, Re. S.N. 607,314, Filed May 4, 1984, Cl. 382/27, BOOM LIMIT SAFETY CONTROL, Eugene L. Gerber, Owner of Record: *JLG Industries, Inc., McConnellsburg, Pa.,* Attorney or Agent: Thomas B. Van Poole, et al., Ex. Gp.: 266

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue

Notice to Subscribers

The Patent and Trademark Office announces a change in the point of contact for subscribers who have not been receiving all of their copies of the Official Gazette, Manual of Patent Examining Procedures Revisions, Annual Indices, or other patent and trademark publications. All correspondence and inquiries concerning subscription services including requests for reinstatement or renewal of subscriptions should be directed to:

Mr. Michael F. DiMario
Assistant Public Printer
Superintendent of Documents (SD)
U.S. Government Printing Office
Washington, D.C. 20401

Furthermore, the Superintendent of Documents advises that expiration notices are sent out approximately three months before the expiration date. However, subscribers should not rely on this schedule. If a notice is not received within two months of the expiration date, the subscriber should renew the subscription with the Superintendent of Documents. Attach a label from the envelope in which the publication is received, together with a check covering the amount of the subscription. If a deposit account with the Superintendent of Documents is to be used, include the deposit account number with the renewal.

This notice is effective with the publication date and supersedes the notice published on this subject in 969 O.G. 2, dated Mar. 14, 1978.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

Aug. 3, 1984.

Computer Aided Search for Class 364 Subclasses 200 and 900

In 1975 the Patent and Trademark Office installed an experimental computer search system for searching the computer and digital data processing system arts classified in Class 364/200 and 900. This system, known as Computer Controlled Microform Search System (CCMSS), functioned until 1983 when it could no longer be kept operational.

A new computer aided search system, Online Searching and Computer Aided Retrieval (OSCAR), has been installed and is available to the public. The new system possesses features similar to the previous system in that each subclass is searchable using a topic index list of approximately 400 terms, which may be combined with Boolean logic into a search question. The user is able to view from 5 to 12 pages of documents meeting the search strategy under computer control of a microfilm viewer.

OSCAR has been put on line with a small sample data base of approximately 375 patent documents in each subclass. Patent dates of these documents range from early 1981 to the present. It is expected that in the very near future the entire data base for these subclasses will be available on OSCAR. In the meantime, the existing backup system will continue to be available.

Terminals are available for public use in Crystal Plz. 2, Rm. 5C-22. Patent and Trademark Office personnel will be available to assist the user in terminal operation. Reservations for using the terminals may be made by calling 703-557-3651 during normal business hours.

EARL LEVY,
July 16, 1984. *Director, Group 230*
Patent and Trademark Office.

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1, 2, and 10
Docket No. _____
Practice before the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce

Action: Notice of Proposed Rulemaking

Summary: In Aug. 1983, the Patent and Trademark Office (PTO) proposed amendments to the rules governing standards of conduct and disciplinary proceedings for attorneys and agents who practice before the PTO. Two hearings were held. After reviewing written comments and oral presentations at the hearings, the PTO decided to withdraw, and not adopt, the rules as then proposed. In Mar. 1984, an advance notice of proposed rulemaking was published. Comments were received. This notice of proposed rulemaking sets forth changes that the PTO is proposing to the rules governing admission to practice before the PTO, standards of conduct for those representing applicants and others before the PTO, and conduct of disciplinary proceedings. Interested individuals are invited to comment on the proposed rules.

Dates: Comments must be submitted on or before Oct. 2, 1984. A public hearing will be held on Oct. 10, 1984, at 9:30 A.M.; request to present oral testimony at the hearing should be received on or before Oct. 2, 1984.

Address: Address written comments to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231 marked to the attention of Fred E. McKelvey.

The hearing will be held in the Commissioner's Conference Rm., 11th Floor, Crystal Plz. Bldg. 3, Rm. 11-C-10, 2021 Jefferson Davis Hwy., Arlington, Va. Written comments and a transcript of the public hearing will be available for public inspection in Rm. 12B10, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

For Further Information Contact: Fred E. McKelvey by telephone at (703) 557-4025 (if no answer, message may be left at 703-557-4103) or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: Attorneys and agents practice before the Patent and Trademark Office (PTO) in patent cases. 35 U.S.C. 31. Attorneys also practice before the PTO in trademark and other non-patent cases. 5 U.S.C. 500 (b). A limited number of agents also practice before the PTO in trademark cases under rules in force prior to Jan. 1, 1957.

A notice of proposed rulemaking for attorney and agent conduct and disciplinary procedure was published on Aug. 11, 1983 in the Federal Register, 48 F.R. 36478, and on Sept. 20, 1983 in the *Official Gazette*, 1034 O.G. 39, 1034 TMOG 33. A notice extending the comment period and setting a second hearing was published on Oct. 5, 1983 in the Federal Register, 48 F.R. 45424, and on Oct. 18, 1983, in the *Official Gazette*, 1035 O.G. 19, 1035 TMOG 17. The PTO decided to withdraw, and not adopt, the rules proposed in the Federal Register notice of Aug. 11, 1983. There were numerous objections to the proposed rules and the public indicated that a longer period for study and review of a code of conduct and disciplinary procedures was necessary.

An advance notice of proposed rulemaking setting out revised rules being considered for standards of conduct and disciplinary proceedings was published on Mar. 16, 1984, in the Federal Register, 49 F.R. 10012, and on Apr. 10, 1984, in the *Official Gazette*, 1041 O.G. 15, 1041 TMOG 13. Numerous organizations and individuals filed comments in response to the advance notice.

This notice of proposed rulemaking sets out rules being proposed in three areas:

(1) Rules governing practice of attorneys and agents before the PTO in patent, trademark, and other non-patent cases (§§10.2 through 10.19);

(2) Rules setting out a PTO Code of Professional Responsibility (§§10.20 through 10.112); and

(3) Rules governing (a) investigation of possible violations of the PTO Code of Professional Responsibility and (b) disciplinary proceedings to reprimand, suspend, or exclude (disbar) individuals practicing before the PTO who, after notice and opportunity for a hearing, are found to have violated a disciplinary rule of the PTO Code of Professional Responsibility (§§10.130 through 10.170).

Familiarity with the advance notice is assumed. Changes in the text of the rules proposed in this notice from the text of the rules published for comment in the advance notice are discussed.

The comments received in response to the advance notice are analyzed.

Tables 1, 2, and 3 are included in this notice to assist readers in correlating present rules with the proposed rules and to find the principal source for the proposed rules. An indication in Tables 1, 2, or 3 that a section is "new" means that a corresponding section does not currently appear in Title 37 of the Code of Federal Regulations.

Table 1 shows the principal sources of the proposed rules which relate to (1) admission to practice of attorneys and agents in patent cases and (2) practice in trademark and other non-patent cases.

Table 2 shows the principal sources of the proposed rules for the PTO Code of Professional Responsibility.

Table 3 shows the principal sources of the proposed rules for disciplinary proceedings.

Other sources for, and rationale in support of, the proposed rules were set and discussed in the Supplementary Remarks of the advance notice. 49 F.R. 10012–10022.

Changes in Text of Advance Notice: Several changes have been made in the text of the rules being proposed from the text of the rules which were published for comment in the advance notice. Those changes are discussed below.

Section 1.21(a) is proposed to be revised by adding a requirement for a $60.00 fee for seeking review of a decision of the Director of Enrollment and Discipline under proposed §10.2(c) and for requesting regrading of an

examination under proposed §10.7(c). No specific fee was set out in the advance notice.

The preamble to proposed §10.1 is being changed by adding a provision which makes clear the PTO's intent to limit Subpart 10 solely to the practice of patent, trademark, and other law before the PTO. The preamble is also being changed to indicate that Subpart 10 shall *not* be construed to preempt the authority of any State to maintain control over the practice of law within its borders, *except* to the extent necessary for the PTO to accomplish its federal objectives. These changes are being made to make clear that the PTO intends to regulate only conduct related or relevant to the practice of law before the PTO. See *Sperry* v. *Florida ex rel. Florida Bar*, 373 U.S. 379, 402 (1963).

The definition of "practitioner" has been changed in proposed §10.1(r). The amendment defines a practitioner as an individual registered to practice before the PTO in patent cases or an individual qualified under 5 U.S.C. 500(b) or otherwise to practice before the PTO in trademark and other non-patent cases. This definition is necessary in order to give a proper meaning to other proposed sections, e.g., proposed §§10.48 and 10.49. The original definition was confined to individuals who actually practice before the PTO in trademark and other non-patent cases. The definition was intended to limit the regulatory effect of PTO rules to those who in fact practice before the PTO. An amendment made to the preamble of proposed §10.1, however, makes clear the intent of the PTO to limit its regulation of attorneys and agents only to the extent necessary for the PTO to accomplish its federal objectives.

Proposed §10.2(a) is being changed to require that the Director shall be an active member in good standing of the bar of a State.

Proposed §10.2(c) has been changed by deleting the last sentence which appeared in the text of the advance notice and read as follows: "The Commissioner may delegate to appropriate Office employees the determination of a petition under this section."

Several changes have been made to proposed §10.4 in response to comments received. In proposed §10.4(a), the Committee on Discipline will consist of at least three employees of the PTO, none of whom reports directly or indirectly to the Director or the Solicitor. Each member of the Committee on Discipline would be a member in good standing of the bar of a State. Proposed §10.40(b) would prohibit the Director, and employee under the direction of the Director, or an associate solicitor or assistant solicitor from participating in deciding a disciplinary proceeding. Related changes have also been made to proposed §10.14(b) which would provide that the Commissioner shall designate at least two associate solicitors in the Office of the Solicitor of the PTO to act as counsel for the Director in prosecuting disciplinary cases. In prosecuting disciplinary cases, the designated associate solicitors shall not involve the Solicitor or Deputy Solicitor. The purpose for this non-involvement is to leave the Solicitor and Deputy Solicitor insulated from the investigation and prosecution phases of a disciplinary case in order that they shall be available as counsel to the Commissioner in deciding disciplinary cases.

The word "applicants" in the first sentence of §10.14(c) immediately prior to the word "provided" is being changed to "applications" to correct a typographical error.

The reference in proposed §10.15 to "§10.156(b)" has been changed to "Subchapter" inasmuch as suspension or exclusion can occur under various proposed sections, such as §§10.133(b), 10.154(a), and 10.156(b).

In §10.22, the word "court" is being added after "State" in both sections (a) and (b) to clarify the fact that membership in the bar of a State court is what is intended in proposed §10.22.

Proposed §10.23(c)(8) has been changed to alter the conditions under which a practitioner must forward correspondence he or she receives on behalf of a client or former client. As proposed, §10.23(c)(8) would require a practitioner to forward to a client or former client, or to timely notify the PTO of an inability to so forward, correspondence received from the PTO or an opponent in an *inter partes* case when the correspondence (1) could have a significant effect on a matter pending before the Office, (2) is received by the practitioner on behalf of a client or former client, and (3) is correspondence which a reasonable practitioner would believe under the circumstances should be forwarded to the client or former client.

The language "knows, or should have reasonably known" in proposed §10.23(c)(17) has been changed to "knows, or has been advised by the Office" in response to a comment.

Paragraph (c) of §10.31 of the advance notice is being replaced by two new paragraphs (c) and (d). The change is necessary to permit non-lawyers authorized to practice in trademark cases before Jan. 1, 1957, to hold themselves out as authorized to so practice. See e.g. *Holmgren* v. *Watson*, 110 USPQ 174 (D.D.C. 1956) and proposed §10.14(b). Paragrph (c) of proposed §10.31 covers this situation. Paragraph (d) of §10.31 precludes a non-lawyer from holding himself or herself as being an attorney or lawyer. It also precludes a non-lawyer from holding himself or herself out as authorized to practice before the Office in non-patent and trademark cases, e.g., representing a respondent in a disciplinary case or representing a party in an *inter partes* disqualification proceeding.

Paragraph (b) of proposed §10.32 as it appeared in the advance notice has been deleted. Paragraphs (c) and (d) have been redesignated as paragraphs (b) and (c), respectively. As it appeared in the advance notice, paragraph (b) would have required practitioners to preserve for two years copies and recordings of advertisements. While no comment criticized the new recordkeeping requirement of proposed §10.32(b), the PTO nevertheless believes, consistent with the policy of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, that the recordkeeping requirements which proposed §10.32 would have imposed are not necessary. Practitioners may, however, wish to voluntarily maintain copies and recordings of any advertising inasmuch as the copy or recording would be the best evidence of the content of the advertisement.

Proposed §10.34 is being changed to add in paragraph (b) the language "except that any practitioner who was registered prior to Nov. 15, 1938, may refer to himself or herself as a 'patent attorney.' " This change is needed to continue the PTO practice of permitting all individuals registered prior to Nov. 15, 1938, to refer to themselves as patent attorneys. See McCrady, *Patent Office Practice*, pp. 454 and 459 (4th Ed. 1959).

In proposed §10.40(a), the language "his or her client, allowing time for employment of" has been added. This language is needed to conform proposed §10.40(a) to DR 2-110(A)(2) of the Code of Professional Responsibility of the American Bar Association (1980). The language of proposed §10.40(c)(1)(vi) has been changed pursuant to a suggestion received in a comment. Proposed §10.40(c)(1)(vi) now reads "has failed to pay one or more bills rendered by the practitioner for an unreasonable period of time or has failed to honor an agreement to pay a retainer in advance of the performance of legal services."

In proposed §10.57(d), the language "practitioner's employee's associates" appearing in the advance notice has been corrected to read "practitioner's employees, associates". This change corrects a typographical error.

The text of proposed §10.64(a) has been changed to permit a practitioner to acquire a proprietary interest in the subject matter of a patent proceeding before the PTO. As originally proposed, acquisition of such an interest would have been prohibited. The text of proposed §10.64(a) is now consistent with Informal Opinion No. 280 of the American Bar Association which states: "A lawyer may acquire an interest in a patent for his [or her] fee."

Paragraph (b) of proposed §10.65 as it appeared in the

advance notice has been deleted in response to a suggestion in a comment.

Subparagraphs (1) and (2) of proposed §10.68 (c) as set out in the advance notice have been deleted in response to comments received.

Subparagraph (7) of proposed §10.85(a)(7) as it appeared in the advance notice has been deleted and subparagraphs (8) and (9) have been renumbered as (7) and (8) respectively.

In proposed §10.85(b)(1), the language "except when the information is protected as privileged communication" which appeared in the text of the advance notice is being deleted in view of comments which were received.

The word "controlling" has been inserted before "legal authority" in proposed §10.89(b)(1) to make clear that only controlling legal authority need be cited.

Proposed §10.93(b)(2) has been changed to correct an incorrect reference to "practitioner" with "the adverse party." "Counselor" has been changed to "counsel or" in proposed §10.93(b)(3).

Paragraph (b) of §10.133 in the advance notice has been re-written and replaced with proposed paragraphs (b), (c), and (d). Paragraph (c) as it appeared in the advance notice is now paragraph (e). The changes are being made to provide for resignation from practice before the Office and that the Commissioner be authorized to enter an order excluding a practitioner "on consent" when a resignation is filed during the pendency of an investigation under proposed §10.131 or after charges have been filed under proposed §§10.132(b) and 10.134. The changes are being made pursuant to a comment which is discussed later in this notice.

In proposed §10.134(a)(2) the word "alleged" has been inserted before "violations" in response to a suggestion.

Pursuant to a suggestion in a comment, the word "of" has been inserted after "period" in the second sentence of proposed §10.135(c).

The language "any new matter" in proposed §10.136(e) has been changed to "any affirmative defense" in response to a suggestion in a comment.

The language "facts of law" in §10.139(b)(7) has been changed to "facts or law" in response to two comments.

Changes have been made to proposed §10.140(b). See the discussion above under the changes to proposed §10.4(b).

Proposed §10.141 as set out in the advance notice has been changed by adding a paragraph (c) to provide that the administrative law judge (ALJ) or the Director may provide for filing papers and other matter by hand or by "Express Mail."

In response to a suggestion in a comment, "or" has been added after the semicolon at the end of paragraphs (a)(1), (a)(2), and (c)(1) of proposed §10.142.

Three changes have been made to proposed §10.144(c) in response to a suggestion made in a comment: (1) "A hearing in a disciplinary proceeding" has been changed to "A hearing under this section"; (2) "and subject to 10.159(c)" has been added after "If a disciplinary proceeding results in disciplinary action against a practitioner"; and ", including any settlement agreement," has been added after "the record of the entire disciplinary proceeding".

In response to a comment, proposed §10.149 has been added and sets out the burden of proof for the Director and the respondent. The Director must prove his or her case by a preponderance of evidence. A respondent must prove any affirmative defense by a preponderance of evidence.

In response to two comments, proposed §10.150(c) is being changed to make clear that objection to evidence and rulings on the objections will be part of the record.

The language "to the" has been inserted after "shall transmit a copy to the representative of the Director and" in proposed §10.154(a). This change is being made pursuant to a suggestion received in a comment. The word "reprimand" has been inserted after "the administrative law judge shall explain the reason for any penalty of" in proposed §10.154(b). This change is also made in response to a comment.

Paragraph (c) has been added to proposed §10.155 to permit reopening of disciplinary proceedings. The change is being made in response to a comment.

The fifth sentence of proposed §10.156(a) has been changed to read: "The Commissioner shall transmit a copy of the final decision to the Director and to the respondent." This change is being made in response to a comment.

The reference to Local Rule 1-26 of the U.S. District Court for the District of Columbia has been corrected in proposed §10.157(a).

A paragraph (b) has been added to proposed §10.157 to make explicit the authority of the Commissioner to grant a stay of a final decision pending judicial review under 35 U.S.C. 32.

Proposed §10.158(b)(1) has been amended to read: "Within 30 days of entry of the order of suspension or exclusion, notify all bars of which he or she is a member and all clients of the practitioner in separate written communications of the suspension or exclusion and shall file a copy of each written communication with the Director." This change has been made in response to two separate comments addressing different issues.

The language "the practitioner" in the second sentence of proposed §10.159(b) has been changed to "any practitioner" in response to a suggestion.

Section 10.170 is being added to expressly authorize the Commissioner to suspend or waive requirements of Part 10 in extraordinary situations when justice requires. The term "Commissioner" in proposed §10.170 is intended to mean the Commissioner, the Deputy Commissioner, or an Assistant Commissioner appointed under 35 U.S.C. 3. Section 10.170 would not permit the routine filing of petitions seeking suspension or waiver of a rule. For example, §10.170 would not contemplate the filing of a petition to enlarge the type of discovery authorized by the rules or to interfere with the ALJ's conduct of disciplinary proceedings except in truly extraordinary situations. It is contemplated that if §10.170 is adopted that there would be relatively few, if any, circumstances in which it would be appropriate to suspend or waive a provision of Part 10.

Response to and Analysis of Comments: Thirty-one (31) written comments were timely received in response to the advance notice. The comments have been analyzed. Some suggestions made in comments have been adopted and others have been rejected. A detailed analysis of the timely received comments follows. Some comments were received on July 9, 1984, but were not properly addressed to Box 8 as requested in the advance notice. As a result, these comments did not reach appropriate PTO officials for timely consideration. These comments, as well as comments received on or after July 10, 1984, will be considered as comments received in response to this notice and will be analyzed in connection with any rules which may be issued based on this notice.

Several comments were received which suggested that the rules as set out in the advance notice purport to regulate attorney conduct beyond that necessary or proper for administration of federal programs by the PTO. It is not, and has never been, the intention of the PTO to regulate conduct except to the extent necessary for the accomplishment of federal objectives. Thus, only that conduct which is relevant to the practice of patent, trademark, or other law *before the PTO* is what the PTO seeks to regulate. The preamble of proposed §10.1 has been amended to indicate that Subpart 10 governs solely the practice of patent, trademark, and other law before the PTO. As noted in the preamble to proposed §10.1, "[n]othing in this subpart shall be construed to preempt the authority of each State to maintain control over the practice of law within its borders, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives." See *Sperry* v. *Florida ex rel. Florida Bar*, 373 U.S. 379, 402 (1963). See also *Michigan Canners and Freezers Ass'n.* v. *Agricultural Marketing and Bargaining Board*, 104 S.Ct. 2518, 2523 (1984) (State Law is preempted when it stands as an ob-

stacle to the accomplishment and execution of the full purposes and objectives of Congress) and *Fidelity Federal Savings and Loan Ass'n.* v. *de la Cuesta*, 102 S.Ct. 3014, 3022 (1982)(federal regulations have no less preemptive effect than federal statutes).

One comment suggested that the definition of application in proposed §10.1(b) include papers relating to a request for or a reexamination of a patent. This suggestion is not being adopted. Reexaminations fall with the definition of proceedings before the Office in Proposed §10.1(s).

One comment suggested that the definition of "attorney" in §10.1(c) be changed to require an attorney to be in good standing in the "venue" of his or her "office." The suggestion in the comment would exclude from the definition of "attorney" an individual in good standing in State A, but living in State B and excluded in State B. The suggestion has not been adopted inasmuch as it is believed to be in conflict with the provisions of 5 U.S.C. 500(b).

One comment suggested that the Commissioner should not delegate to other PTO employees for decision petitions from the Director under §10.2. This suggestion is being adopted and the last sentence of proposed §10.2(c) as it appeared in the advance notice is being deleted. It is contemplated that petitions seeking review of a decision of the Director will be decided by the Commissioner, the Deputy Commissioner, or one of the two Assistant Commissioners appointed pursuant to 35 U.S.C. 3. These employees would, of course, be able to obtain legal advice from the Solicitor or Deputy Solicitor.

One comment suggested that the definition of "law firm" in proposed §10.1(k) be extended to corporate legal departments. This suggestion is not being adopted. It is not readily apparent from the comment why the definition of law firm should be expanded as suggested.

One comment suggested that the Director should be a member in good standing of the bar of a State. This suggestion is being adopted and proposed §10.2(a) will require any Director to be an active member in good standing of the bar of a State or the District of Columbia.

Two comments were received with respect to proposed §10.4 which indicated that the Director and associate solicitors should not be members of the Committee on Discipline. The PTO believes that these comments have merit. Accordingly, it is proposed to create a Committee on Discipline composed of at least three employees of the PTO who do not report to either the Director or the Solicitor and who are members of the bar in good standing of a State. The Committee on Discipline would determine whether there is probable cause for the Director to file charges. See proposed §§10.4(b) and 10.132. Related changes are also being made in proposed §10.140. The same comment suggested that the proposed rules do not articulate a separation of functions between the investigation (done by the Director) and prosecution (done by an associate solicitor) on the one hand and the decision making function (done by the Commissioner with advice as necessary from the Solicitor or Deputy Solicitor) on the other hand. The PTO believes this comment also has merit. Accordingly, proposed §10.140(b) has been changed to make clear that the Commissioner will designate two associate solicitors in the Office of the Solicitor to act as representative for the Director in disciplinary proceedings. In prosecuting disciplinary proceedings, the designated associate solicitors shall not involve the Solicitor and Deputy Solicitor. The purpose of insulating the Solicitor and Deputy Solicitor from the designated associate solicitors handling disciplinary cases is to maintain a clear line of distinction between the investigative/prosecutorial function and the deciding function. The designated associate solicitors would report directly to the Director insofar as their disciplinary prosecutorial functions are concerned. The Solicitor and Deputy Solicitor would be available to act as legal counsel to the Commissioner in deciding appeals from decisions of an ALJ and would not be responsible in any manner for supervising the designated associate solicitors in the performance of their disciplinary/prosecutorial functions.

One comment suggested that individuals be appointed to the Committee on Discipline who are not employees of the Department of Commerce. The comment recognized that such an appointment would create difficulties in view of 35 U.S.C. 122. The PTO had given specific consideration to appointing practitioners to the Committee on Discipline prior to issuance of the advance notice. The idea was rejected for two reasons. Problems under 35 U.S.C. 122 make such an appointment difficult. Administrative delays would take place because it would be more difficult to arrange times for the Committee to meet. Another comment recognized the administrative difficulty in having a "committee" of more than one individual. By having the Committee on Discipline composed of PTO employees, there would be minimal administrative problems in arranging for and holding meetings of the Committee. Accordingly, the PTO proposes to adhere to its prior view that members of the Committee on Discipline should be PTO employees.

Another comment suggested, in effect, that the PTO should consider and adopt the general procedures set out in the Standards for Lawyer Discipline and Disability Proceedings of the American Bar Association (1979). The "Standards" were considered prior to issuance of the advance notice. After considering the Standards then, and reconsidering the Standards in view of the comments received, the PTO has decided not to propose the "Standards."

One comment suggested that every attorney be required to designate under §10.5 the "venue" of his or her office. The rationale in support of the comment suggested that an attorney disbarred in State A, but in good standing in State B, should not be registered as an attorney if he or she resides in State A. The suggestion is not being adopted, because of administrative problems which would be raised with determining "venue" in those cases where an attorney has offices in two states and spends considerable time in both offices. Attorneys who are members of multi-state law firms might also have difficulty selecting an appropriate "venue." Moreover, it is believed that introduction of a "venue" concept might lead to lack of uniform treatment of patent and trademark attorneys in view of the provisions of 5 U.S.C. 500(b) relating to practice of non-patent law before the PTO.

One comment suggested that §10.6 should be changed to permit a non-citizen registered under paragraph (a) to remain registered even if the non-citizen ceases to reside in the United States. The suggestion is not being adopted. The registration of non-citizens residing in a foreign country is presently governed by 37 CFR §1.341(e) and under the proposed rules would be governed by §10.6(c). There is no known legal requirement or other public policy which compels or makes desirable the registration or continued registration of non-citizens residing in a foreign country other than under the conditions specified in proposed §10.6(c).

One comment suggested that after the word "Office" in proposed §10.6(b) that the following be inserted: "only in patent matters." The purpose of the suggestion was to make clear that patent agents are authorized to practice only in patent cases. The definition of "registration" in proposed §10.1(u) limits "registration" of patent agents in accordance with the suggestion.

One comment suggested that the requirement of proposed §10.7(a)(2)(i) that an individual seeking registration establish to the satisfaction of the Director that he or she is of good moral character should be deleted. According to the comment, moral character "does not concern patent practice and, hence, should be outside the scope of the rules for the Office." The contrary is readily apparent from 35 U.S.C. 31 which states that the Commissioner may require applicants for registration "to show that they are of good moral character and reputation . . . "

One comment agreed that limited recognition under

proposed §10.9 is justified in certain cases. The comment went on to suggest that limited recognition may be appropriate in a re-examination proceeding when the patent sought to be re-examined is also involved in litigation is being handled by a non-registered attorney. Whether limited recognition would be granted under these circumstances would depend on the particular facts involved.

One comment suggested that a definition be included in proposed §10.1 for the term "firm" which appears in proposed §10.14(e). This suggestion is not being adopted. The term "firm" currently appears in 37 CFR §2.12(e) and has not created any known problems in the PTO's administration of the trademark statute. The comment expressed a belief that "firm" includes "partnership." The term has been given a broad construction in the past and would continue to be given a broad construction under proposed §10.14(e). The term would include, among other things, a partnership.

Two comments suggested that a non-attorney should not be permitted to represent a firm, corporation, or association. One comment accurately pointed out that a non-lawyer may not represent a juristic entity before the U.S. Court of Appeals for the Federal Circuit. *Richdel, Inc.* v. *Sunspool Corp.*, 699 F.2d 1366, 217 USPQ 8 (Fed. Cir. 1983). Inasmuch as prosecution of trademark matters by non-attorneys (those qualified prior to Jan. 1, 1957) has not created any undue administrative problems to date, the suggestion is not being adopted and it will be proposed to permit non-attorneys to continue to represent firms, corporations, and associations as set forth in proposed §10.14(e).

One comment suggested that proposed §10.14(e) would not permit an individual to represent himself or herself in a trademark case. Any individual is entitled to represent himself or herself in any patent, trademark, or other case before the PTO. Proposed §10.14(e) relates to "practice" before the PTO. The comment suggests that proposed §10.14(c) limit recognition of foreigners to practice in *ex parte* cases only. This suggestion is not being adopted. No reason was given in the comments as to why a foreigner, otherwise qualified to practice in trademark cases, should be restricted to *ex parte* cases.

While the PTO did not receive any comments concerning proposed §10.18, it should be noted that under the rules being proposed an attorney would be required to personally sign papers he or she files in the PTO. In the past, there has been some confusion as to whether someone other than the practitioner may sign a paper on his or her behalf and whether a stamp of a facsimile of the practitioner's signature may be used. Proposed §10.18 is intended to clarify the requirement of a personal signature. Thus, under proposed §10.18, a practitioner's secretary could not properly sign a paper to be filed in the PTO on behalf of an attorney. Likewise, an associate of an attorney could not properly sign on behalf of the attorney—the associate would sign his or her own name to the paper. Under proposed §10.18 a stamp of a facsimile of an attorney's signature would not be acceptable. Compare *Ex parte Minehan*, 1908 Dec. Comm'r. Pat. 137 (Comm'r Pat. 1908).

One comment suggested that the PTO had not justified its authority to establish its own Code of Professional Responsibility and that, in any event, the PTO should incorporate by reference the Model Rules of Professional Conduct of the American Bar Association (1983). The Commissioner has authority to establish regulations governing the conduct of those practicing law before the PTO. See 35 U.S.C. 31. See also 35 U.S.C. 6. Inasmuch as the PTO has authority to establish a PTO Code of Professional Responsibility, it may elect to set the Code out in the Code of Federal Regulations or it may —as it has in the past—incorporate a code of conduct by reference. 37 CFR §§1.344 and 2.13. Many comments have encouraged the PTO to set out its Code of Professional Responsibility in the CFR. The proposed PTO Code of Professional Responsibility is based primarily on the Model Code of Professional Responsibility of the American Bar Association (1980). While the comment urged that the Model Rules of Professional Conduct be adopted as the standard, this suggestion is not being adopted because it has not been established that the Model Rules are the standard of conduct throughout the States.

One comment suggested that the word "court" be added in proposed §10.22 after "State" in both sections (a) and (b). This suggestion has been adopted in order to clarify that membership in the bar of a State court is what is intended.

One comment, which is not being adopted, suggested that "knowingly or recklessly" be inserted in proposed §10.22(a) before "made.". When one makes a "false" statement or "deliberately" fails to disclose a material fact, one does so knowingly or recklessly. Accordingly, the suggested change is unnecessary.

One comment suggested that proposed §10.22(b) "which subjects a practitioner to disciplinary sanction for furthering the application for registration of membership of another who is not qualified in a bar, administrative agency or the like should be shown and explained." Any practitioner who furthers the application of another to any bar knowing the other not to be qualified demonstrates that the practitioner is not capable of objectively representing those who have business before the Office. Moreover, any such practitioner would have shown himself or herself to be "disreputable" within the meaning of 35 U.S.C. 32.

Some comments were received which suggested that the PTO should not adopt a provision which defines misconduct engaging in illegal conduct involving moral turpitude. See proposed §10.23(b)(3). The PTO is not adopting this suggestion. The Patent Statute provides that the Commissioner may suspend or exclude practitioners who are shown to be disreputable or who engage in gross misconduct. 35 U.S.C. 32. Some states continue to provide for disciplinary action for attorneys who engage in illegal conduct involving moral turpitude. To the extent that illegal conduct involving moral turpitude is disreputable or gross misconduct, no cogent reason has been represented why the Commissioner should not be able to take appropriate disciplinary action based on that conduct. For the most part, individuals and organizations making the suggestion not to adopt a provision which defines misconduct as including illegal conduct involving moral turpitude also urged that the Model Rules of Professional Conduct of the American Bar Association (1983) be adopted as the PTO Code of Professional Responsibility. It was argued that adoption of the Model Rules would make the PTO Code of Professional Responsibility consistent with the State codes. Those making the suggestion, however, failed to demonstrate that the States have uniformly adopted the Model Rules or that they are likely to do so. Virginia, for example, in 1984 declined to adopt the Model Rules. Accordingly, the PTO is proposing to adopt a PTO Code of Professional Responsibility which is modeled for the most part on the Code of Professional Responsibility of the American Bar Association (1980).

One comment suggested that all reference to "moral turpitude" be deleted from proposed §10.23. This suggestion is not being adopted. Contrary to the argument in the comment, the PTO believes that there are situations where moral turpitude may be related to the characteristics needed for an individual to practice before the PTO. While it is not always easy to articulate the relationship, nevertheless it does exist. For example, a practitioner convicted of rape is not the type of practitioner which should properly represent women. See e.g., *In re Robertson*, 429 A.2d 345 (D.C.App. 1982). Each disciplinary case will have to be handled on the basis of its own facts. Accordingly, the references to "moral turpitude" are not being deleted from proposed §10.23.

Several comments suggested that scienter or knowledge be made a requirement for violation of the various provisions of proposed §10.23(c). These comments have been reviewed along with the provisions of proposed §10.23(c). It is concluded that the language of the various paragraphs of proposed §10.23(c) inherently require

scienter or knowledge or that scienter or knowledge is irrelevant.

One comment suggested that proposed §10.23(c)(5) be amended to make clear that suspension or exclusion from a State bar for failure to pay bar dues not be a basis for suspension before the Office. While no change will be made to proposed §10.23(c)(5) in response to the comment, it seems obvious that failure to pay State bar dues is not a basis for suspension or exclusion before the PTO because failure to pay the dues has no relationship to the federal objectives which the PTO seeks to accomplish.

Three comments were received addressing proposed §10.23(c)(8). One comment suggested that in addition to clients and former clients, the rule should cover correspondence received on behalf of a former partner or former associated attorney. This suggestion is being rejected inasmuch as the PTO believes that the principal thrust to which the rules should be directed is the practitioner-client relationship. The proposed rules do not purport to solve problems which may arise between former partners and associates. Normally, that is a matter left to state law. One comment suggested that subparagraphs (i) and (ii) of §10.23(c)(8) were not relevant. This comment has been adopted and the proposed section has been revised. Two comments suggested that §10.23(c)(8) as proposed required the forwarding to clients of miscellaneous papers which a client might not normally wish to receive. These two comments are considered to have merit. The PTO recognizes that a practitioner may receive papers which need not, and should not necessarily, be forwarded to a client. On the other hand, the PTO has experienced cases where a practitioner did not forward to a client a paper received from the PTO when the client should have been notified of the decision rendered by the paper. In one case, the client lost his right to appeal a final decision of the Board of Patent Interferences. The precise facts were these. After receiving an adverse decision on priority, the client without informing his retained counsel, ("first" practitioner), sought the advice of a "second" practitioner. The second practitioner, sought an extension of time to file a request for reconsideration. See 37 CFR §1.34(b). The request was denied by the board and was mailed to the first practitioner at the address of record in the interference file. See 37 CFR §1.33(a). The first practitioner assumed that the second practitioner knew of the denial and did not notify the client of the denial. Under proposed §10.23(c)(8), the first practitioner would have been obligated to forward the denial to the client because the denial (1) obviously has a significant effect on a matter pending before the PTO, (2) was received on behalf of a client, and (3) was correspondence which a reasonable attorney under the circumstances would have forwarded to a client. Having not made the request for an extension of time, the first practitioner would reasonably presume that someone filed the request and should know that the client needs to know the request has been denied.

One comment suggested that proposed §10.23(c)(9) would include as misconduct the use of a certificate of mailing on an item excluded under 37 CFR §1.8(a)(2)(ix). The comment further suggests that proposed§10.23(c)(9) be limited to use of "false declarations" of a date of mailing. The suggestion is not being adopted, because §10.23(c)(9) is limited to those instances wherein a practitioner "knowingly" misuses a certificate of mailing. An innocent use of a certificate of mailing on a paper excluded by §1.8 is not "knowingly" misusing a certificate of mailing.

One comment suggested that proposed §10.23(c)(12) is in conflict with Standard 8.3 of the Standards for Lawyer Discipline and Disability Proceedings of the American Bar Association (1979). As noted above, the PTO has not proposed to adopt those standards. The comment goes on to suggest that 29 of 54 disciplinary jurisdictions provide for immunity for complainants. Proposed§10.23(c)(12) is limited to practitioners who file complaints and is designed to prevent the filing of a frivolous complaint by one practitioner against another.

One comment suggested that §10.23(c)(17) is not appropriate. The commentator apparently believes that if the various conditions set out in §10.23(c)(17) exist, the practitioner must cease representing the inventor. The commentator did not understand the purpose behind the proposed section. When the conditions mentioned in §10.23(c)(17) exist, there is a potential conflict of interest between the inventor and the practitioner. This conflict of interest was recognized in *Lefkowitz* v. *Lawrence Peska Associates, Inc.*, 393 N.Y.S.2d 650, 652 (Sup. Ct. N.Y. 1977)(attorneys who receive business regularly from an invention developer might not always act in the best interests of the inventors as opposed to the interests of the invention developer). Proposed §10.23(c)(17) would not require a practitioner to cease working for an inventor. It would require the practitioner to advise the inventor of certain facts and permit the inventor to determine, after being advised of any possible conflict, whether the practitioner should continue to represent the inventor or a joint venture consisting of the inventor and the invention promoter.

One comment suggested that the "knows, or should have reasonably known" standard in proposed §10.23(c)(17) of the advance notice is too stringent. Upon consideration, the PTO is inclined to agree with the comment. The "should have reasonably known" was originally intended to cover situations where the PTO has advised a practitioner of specific facts. Accordingly, an amendment to conform proposed §10.23(c)(17) to the original intent has been made. The language proposed reads: "knows, or has been advised by the Office."

One comment made the following statement: "Since under" proposed §10.23(c)(18) "an unreasonable allegation of fraud constitutes an act of misconduct, would an allegation of fraud, which is considered by a tribunal to be completely meritless, constitute a violation?" The finding by a tribunal, such as the U.S. Court of Appeals for the Federal Circuit, that an allegation of fraud is frivolous could result in an investigation by the Director. The holding of the tribunal normally would not be "considered conclusive," where the practitioner was not party before the tribunal. Hence, the practitioner would not have had an opportunity to present his or her views or to defend against the allegation. At best, the holding of the tribunal would constitute *stare decisis.* It could be predicted, however, that if the ultimate record before the ALJ is essentially the same as the record before the tribunal then the likelihood of finding a disciplinary violation is very high.

One comment suggested that proposed §10.23(d) should not appear in the rules. According to the comment, proposed §10.23(d) would establish "a negligence standard as a basis of misconduct" and ignores the basic advocacy role of the practitioner and his duty to a client. The suggestion is not being adopted. Proposed §10.23(d) is designed to advise practitioners that they cannot act with reckless indifference to whether a representation is true or false and that "deceitful statements of half-truths" shall be deemed actual fraud. The proposed rule is nothing more than a statement of what evidence might support a charge of fraud against the attorney. The standard articulated in the proposed rule exists in criminal law. See *United States* v. *Beecroft,* 608 F.2d 753, 757 (9th Cir. 1979) wherein the court says: "[o]ne who acts with reckless indifference to whether a representation is true or false is chargeable with knowledge of its falsity. Deceitful statements of half-truths or the concealment of material facts is actual fraud under the statute" (footnotes omitted).

Four comments were received which argued that proposed §10.24 should not appear in the rules. One comment argued that it might be difficult to determine whether another practitioner had violated a disciplinary rule. The comment went on to submit "that the rules of the State bars adequately already cover this area." The rules of the various State bars do not govern proceedings before the PTO and would not cover non-lawyers who practice before the PTO. Moreover, proposed

§10.24 is identical to the current rules (37 CFR §1.344 and DR 1-103 of the Code of Professional Responsibility of the American Bar Association (1970)) and the 1980 Code of Professional Responsibility of the American Bar Association.

The second comment also voiced objection to proposed §10.24 and argued that "[a] practitioner should be under a duty not to engage in unlawful conduct, but he or she should not be under a duty to 'turn in' his [or her] associates or partners." The comment did not articulate a reason why a practitioner should not be under a duty to "turn in" his or her associates or partners. If an associate or partner is engaging in unprofessional conduct and does not cease such conduct when it is called to his or her attention, there is no known reason why the rules should not require a practitioner to notify the PTO of the conduct of the associate or partner. Compare 18 U.S.C. 4 relating to concealment of knowledge of the actual commission of a felony.

One comment suggested that proposed §10.30 amounts to slavery. Proposed §10.30 is a "Canon." A similar Canon exists in the current rules (37 CFR §1.344 and Canon 2 of the Code of Professional Responsibility of the American Bar Association (1970)). There are similar canons in states. See e.g., Canon 2 of the Virginia Code of Professional Responsibility (1984). A "canon" is defined in proposed §10.20 as a statement of an axiomatic norm expressing in general terms the standards of professional conduct expected of practitioners in their relationships with the public, the legal system, and the legal profession. Proposed §§10.31 through 10.40 set forth the proposed mandatory conduct which would be expected of practitioners under proposed §10.30.

Three comments suggested that a change be made in proposed §10.31(c) to permit non-lawyers authorized to practice before the PTO in trademark cases to hold themselves out as authorized to do so. The comments are being adopted and an appropriate change has been made to proposed §10.31(c). Paragraph (c) of the advance notice is replaced with paragraphs (c) and (d) as set out herein. Paragraph (c) of proposed §10.31 permits a practitioner authorized to practice in trademark cases to hold himself or herself out as authorized to so practice. Paragraph (d) of proposed §10.31 precludes a nonlawyer from holding himself or herself out as authorized to practice in non-patent and trademark cases, e.g., representing a respondent in a disciplinary case or representing a party in an *inter partes* disqualification proceeding.

One comment was received which suggested that proposed §§10.31, 10.32, and 10.33 "incorporate a requirement that a practitioner be prohibited from issuing communications which were [are ?] false, fraudulent, or misleading." This suggestion is not being adopted inasmuch as it is believed proposed §10.31(a) prohibits such communications. Compare 35 U.S.C. 32.

One comment suggested that proposed §10.33 be rewritten to completely conform to Rule 7.3 of the Model Rules of Professional Conduct of the American Bar Association (1983). Proposed §10.33 is based partly on Rule 7.3, but contains the additional language "under circumstances evidencing undue influence, intimidation, or overreaching." Proposed §10.33 is designed to prohibit so-called "ambulance chasing." In *Ohralik* v. *Ohio State Bar Ass'n.*, 436 U.S. 447 (1978), the Supreme Court held that a state could lawfully regulate ambulence chasing. In its opinion, the Supreme Court said:

> "We need not discuss or evaluate each of these interests in detail as appellant has conceded that the State has a legitimate and indeed 'compelling' interest in preventing those aspects of solicitation that involve fraud, undue influence, intimidation, overreaching, and other forms of 'vexatious conduct.' We agree that protection of the public from these aspects of solicitation is a legitimate and important state interest."

436 U.S. at 462. The additional language appearing in proposed §10.33 is designed to limit the application of proposed §10.33 to those situations in which the PTO has a legitimate interest. See also 35 U.S.C. 32 and proposed §10.31(a). Accordingly, the change suggested in the comment is not being adopted.

One comment suggested that proposed §10.34 should make clear that a practitioner registered prior to November 15, 1938, may call himself or herself a "patent attorney." This suggestion is being adopted by adding to paragraph (b) an appropriate exception. All individuals registered prior to November 15, 1938, "were registered as attorneys, whether they were attorneys at law or not, and such registrations have not been changed." McCrady, *Patent Office Practice*, pp. 454 and 459 (4th Ed. 1959). By adopting the suggestion, the proposed rules will reflect current practice.

Two comments were received which indicated that proposed §10.37 would forbid what one comment referred to as "the extremely common practice of 'farming out' work." Proposed §10.37 does not change current pratice. See 37 CFR §1.344 and DR 2-107 of the Code of Professional Responsibility of the American Bar Association (1970). Accordingly, if there is a "common practice" of farming out legal service, the practice is contrary to 37 CFR §1.344. Neither individual suggested that farming out occurs without knowledge by the client. Upon consideration of the comments, it has been decided not to change the text of proposed §10.37. Accordingly, if proposed §10.37 is adopted, "farming out" of legal service could be done ethically only under the conditions specified in §10.37. The present view of the PTO is that clients retain practitioners on an individual or firm basis and that a client ought to know who is doing legal service on its behalf. It should be noted that proposed §10.37 covers only "legal services." It does not cover non-legal services such as searching for patents or trademark registrations, preparing patent or trademark application drawings, obtaining copies of documents, etc.

Eight comments were received with respect to proposed §10.40. One comment suggested that the language "his or her client, allowing time for employment of" be inserted after "giving due notice to." The suggested change has been adopted. A second comment suggested that the language of proposed §10.40(c)(1)(vi) be changed to read: "has failed to pay one or more bills rendered by the petitioner for an unreasonable period of time or has failed to honor an agreement to pay a retainer in advance of the performance of services." The suggested change is being adopted with two minor modifications: the word "practitioner" is being used in place of "petitioners" and the word "legal" is being inserted in front of "services." Proposed §10.40 as it appeared in the advance notice would have required that a practitioner establish that the client deliberately disregarded an agreement or obligation to the practitioner concerning expenses or fees. This would have required proof of a fact which really has nothing to do with the heart of the matter. Whether the failure to pay was "deliberate" in the sense that the client has the money but chooses not to pay it really should not be relevant. What the practitioner should be required to establish is that, for whatever reason, the client has failed to pay his or her bills or has failed to pay an advance which the client agreed to pay prior to the performance of legal services.

Several comments suggested that under proposed §10.40 a practitioner would have to state his reason for wanting to withdraw and that the practitioner might have to reveal that his or her client is engaged in unlawful activity. Under proposed §10.40, a practitioner would normally not have to reveal practitioner/client secrets in support of a petition to withdraw, but a practitioner is obligated to disclose "[t]he intention of a client to commit a crime and the information necessary to prevent the crime." See proposed §10.57(c)(3). A fourth comment was concerned that when a practitioner and a client cannot agree on the merits of a client's case and/or a proposed amendment whether the disagreement has to be stated on the record. Under proposed §10.40, only the fact (but not the nature) of the disagreement need be stated as a basis for petitioning to with-

draw. A fifth comment suggested that there is no need for a petition to withdraw "when there is already a substitute attorney." The comment did not define a "substitute attorney." If a power of attorney is revoked (37 CFR §1.36) when a "substitute attorney" is appointed, a petition to withdraw is not necessary. If a revocation is not filed, any attorney of record continues to be an attorney of record until the power is revoked or the attorney withdraws. The suggestion made in the fifth comment is not being adopted.

One comment was concerned with timing of a decision on a petition to withdraw and suggested that a time be given for the PTO to act. It was further suggested that if the PTO fails to act within a specified time, that failure to act is to be construed as approval of the petition. This suggestion is not being adopted. In patent cases, it is presently contemplated that action will be taken by the Director in the Examining Group in which the patent application is pending or by the Chairman of the Board of Patent Inteferences, if the application is involved in an interference. In trademark cases, it is presently contemplated that a decision on a petition to withdraw would be made by the Director, if an application is pending before a trademark attorney (examiner), or by the Chairman of the Trademark Trial and Appeal Board in those cases where the application is before the board on an ex parte appeal or for *inter partes* proceedings.

One comment suggested that proposed §10.40 does not address the situation where an attorney resigns as member of a corporate legal department. Under current practice (37 CFR §1.36) and proposed §10.40, leave to withdraw would ordinarily be granted to any practitioner who resigns as a member of a corporate patent and/or trademark legal department.

One comment suggested that proposed §10.48 would not permit a registered patent attorney and a general lawyer to share legal fees even when the patent attorney and general lawyer are members of the same firm. Two comments suggested that proposed §10.49 would not permit formation of partnership between a patent attorney and a general attorney. It was not the intent of the rules published in the advance notice to prevent such sharing of legal fees or to preclude formation of such partnerships. In view of the changed definition of "practitioner" in proposed §10.1(r), the concerns expressed in the three comments should no longer exist. See also the change made to the preamble of proposed §10.1. Another comment suggested that proposed §10.49 would make it impossible for a patent attorney and a suspended or excluded practitioner to remain partners. This would be true if the suspended or excluded practitioner continues to practice law before the Office. If the suspended or excluded practitioner does not practice law before the PTO, then no problem is foreseen. As pointed out in discussing the comments concerning proposed §10.158, however, when a partner is suspended or excluded from practice before the PTO, business may not be able to continue as usual.

One comment suggested that the reporting requirements of proposed §10.57 may be different than those imposed by the Code of Professional Responsibility of a given State. This may be true. However, the reporting requirements of the States are not uniform. It follows that the PTO cannot propose a rule which will be consistent with rules in all States.

One comment suggested that proposed §10.62 should specifically authorize a registered patent practitioner to testify concerning attorney diligence in patent cases. This suggestion is not to be adoped. However, it should be clear that in most cases, the exception of proposed §10.62 (b)(3) would apply. As pointed out in the advance notice, however, the weight to be given testimony by a practitioner on behalf of his or her client would be determined on a case-by-case basis. *Wilder* v. *Snyder,* 201 USPQ 927, 934 (Bd.Pat.Int. 1979). The same comment suggested that permission by a client should be made the basis for permitting a practitioner to testify. This suggestion is not being adopted. Virtually all clients would give permission and such permission would not obviate the rationale behind the rule.

Three comments were received which suggested that a patent attorney or agent should be able to acquire a proprietary interest in the subject matter of a patent proceeding before the PTO. There are inventors who would not be able to apply for a patent and secure the assistance of a registered practitioner unless the practitioner may take an interest in the patent as part or all of his or her fee. The text of proposed §10.64(a) is being changed to permit a practitioner to acquire an interest in a patent case. Acquiring an interest in trademark and other non-patent cases would continue to be prohibited. Proposed §10.64(a) is now consistent with Informal Opinion No. 280 of the American Bar Association which states: "A lawyer may acquire an interest in a patent for his [or her] fee." Newly proposed §10.64(a)(3) would not change PTO policy which prohibits a practitioner from obtaining a proprietary interest for the sole purpose of obtaining a filing date under 37 CFR §1.47(b). See *Manual of Patent Examining Procedure,* §409.03(f)(5th Ed. Aug. 1983).

Two comments questioned the need for proposed §10.65(b) as it appeared in the advance notice. In response to these comments, it has been decided to delete paragraph (b) from proposed §10.65.

One comment suggested that Rules 5.1 and 5.2 of the Model Rules of Professional Conduct of the American Bar Association (1983) "are more in tune [than proposed §10.66(a)] with the present day practice of law." It is said that the ABA rules "account for supervisory relationships found in law firms and in corporate legal departments." Proposed §10.66(d) permits the Director or the Commissioner to authorize the creation of "Chinese Walls." In determining whether a "Chinese Wall" can, or should, be erected, the Commissioner should be free to take into account all factors. Compare *Plus Products* v. *Con-Stan Industries, Inc.,* 221 USPQ 1071 (Comm'r.Pat. 1984) and *Sunkist Growers, Inc.* v. *The Benjamin Ansehl Co.,* 221 USPQ 1077 (Comm'r.Pat. 1984).

Two comments were received which indicated, in the words of one comment, that "[u]nder many local jurisdictions, it is permissible for a non-lawyer to own stock in a professional corporation or to be a director or officer thereof." Accordingly, subparagraphs (1) and (2) of proposed §10.68(c) as they appeared in the advance notice have been deleted. Paragraph (c) of proposed §10.68(c) has been revised to limit its application to those situations where the non-practitioner has the right to direct or control the professional judgment of the practitioner. The ownership of professional corporations or associations and the directors and officers thereof are matters which are deemed better left to state law.

One comment was received with respect to proposed §10.85(a)(7) as it appeared in the advance notice. Section 10.85(a)(7) as it appeared in the advance notice has been deleted as being unnecessary. See Fedders, 56 Notre Dame Law. 5, 59-60 (1980).

Several comments were received discussing proposed §10.85(b)(1). Some comments suggested the entire subparagraph should be deleted. Others suggested it should be strengthened. It has been decided to delete from the text of §10.85(b)(1) as it appeared in the advance notice the language "except when the information is protected as a privileged communication." This amendment was suggested by the Statewide Grievance Committee of Connecticut and the Patent, Trademark, and Copyright Section of the Indiana State Bar Association.

Three comments relative to proposed §10.87 were received. All three pointed out a mispelling of the word "advice." One comment questioned whether a practitioner could tell a party who refuses to retain counsel that "I don't think you have a leg to stand on." Proposed §10.87 covers those cases in which the party is represented by counsel. If a party refuses to retain counsel, then a practitioner may deal with that party as he would with a lawyer for that party. In response to another

comment, proposed §10.87 would not preclude a practitioner from recommending direct negotiations between the parties, without counsel present, or from having the private investigators make appropriate field investigations in the marketplace, e.g., to determine likelihood of confusion.

Several comments were received with respect to proposed §10.89. One comment, which is being adopted, suggested that "controlling" be inserted before "legal authority" in proposed §10.89(b)(1). This suggestion is being adopted because the PTO believes that a practitioner should be required to cite only controlling authority. The practitioner, of course, will assume the obligation of determining among known precedents which may be a controlling precedent. One comment suggested that failure to cite controlling authority "should be viewed as a disciplinary violation only under the most grievous circumstances." Failure to cite known controlling authority to the PTO can be a serious matter, particularly in *ex parte* patent and trademark cases. Recently, the Ninth Circuit had occasion to comment on failure of counsel to cite what the court felt was known controlling authority. *Southern Pacific Transportation Co.* v. *Public Utilities Commission of the State of California,* 716 F.2d. 1285, 1291 (9th Cir. 1983). Suffice it to say here, any decision to bring disciplinary action based on an alleged violation of proposed §10.89(b)(1) will depend on the precise facts. Another comment suggested that proposed §10.89(b)(2) "appears to be contrary to the practice of filing anonymous requests for reexamination and anonymous protests." There is no conflict because the identify of a client filing such requests for reexamination and protests is "irrelevant" as a matter of law. See e.g., 35 U.S.C. 301; 37 CFR §1.501.

One comment suggested that proposed §10.89(c)(2) "would have a chilling effect on a practitioner who is attempting to determine what is relevant in the course of discovery and/or who is attempting to impeach a witness." Paragraph (c)(2) is based on DR 7-106(c)(2) of the Code of Professional Responsibility of the American Bar Association (1970), which is currently applicable to practitioners, including trademark practitioners. There is no evidence that the current rule has any chilling effect. Hence, no change is being made in proposed §10.89(c)(2).

One comment suggested that proposed §10.89(c)(3) might preclude asking on cross-examination a question along the lines: "I understand Mr. Doe that you previously were convicted of perjury." Suffice it to say, proposed §10.89(c)(3) would not prohibit such a question.

In response to suggested changes, proposed §10.93(b)(2) has been changed to correct an incorrect reference to "practitioner" with "the adverse party," and "counselor" in proposed §10.89(b)(3) has been changed to "counsel or" to correct a typographical error. One comment suggested a provision be added to the proposed rules to authorize certain conferences with the interlocutory examiners at the Board of Patent Interferences and the Trademark Trial and Appeal Board. This suggestion is not being adopted. Such a provision is not necessary, because (1) interlocutory examiners routinely handle questions regarding procedure and will not entertain improper questions and (2) interlocutory examiners can insist that all parties participate, e.g., through a telephone conference call.

One comment suggested that the language "under circumstances where the practitioner knows or it is obvious that such action is not in the public interest" in proposed §10.101(a)(1) be deleted or that some indication be given of what it means. It is believed that proposed paragraph (a)(1) is sufficiently clear without further definition. The paragraph merely restates the current rules. See 37 CFR §1.344 and DR 8-101(a)(1) of the Code of Professional Responsibility of the American Bar Association (1970).

Two comments were received with respect to proposed §10.112. Neither comment was fully understood. A response to the comments has been mailed to the individuals who submitted the comments and it is hoped that each individual will file additional comments in response to this notice. Any additional comments will be addressed in any notice promulgating rules which may be issued based on this notice.

Several comments on proposed §10.130 were received. One comment suggested that "who is guilty of gross misconduct" be deleted because "gross misconduct" is "undefined". The suggestion its not being adopted, because "gross misconduct" is a basis for suspension or exclusion in 35 U.S.C. 32. There have been cases where a practitioner has been disciplined for engaging in "gross misconduct." See *In re Wedderburn,* 1897 Dec. Comm'r. Pat. 77, 117 (Comm'r. Pat. 1897), particulaly headnotes 15 and 26. Another comment suggested deletion of the word "disreputable" from proposed §10.130. According to the comment, disreputable conduct "does not have anything to do with the concerns of the" PTO. Congress has indicated otherwise, because it has specifically authorized the Commissioner to suspend or exclude those who are shown to be disreputable. 35 U.S.C. 32. The Secretary of the Treasury has the same authority to suspend or exclude those who practice before the Internal Revenue Service. See 31 U.S.C. 1026. Accordingly, the suggestion is not being adopted.

Proposed §10.130(b) would provide that petitions to disqualify counsel in *inter partes* proceedings (i.e., patent interferences and contested cases before the Trademark Trial and Appeal Board) would not be governed by proposed§§10.130 through 10.170. One comment suggested that proposed §10.130(b) is inconsistent with proposed §§10.24 and 10.85 which require that certain ethical violations be reported to the PTO. There is no inconsistency between proposed §10.130 and §§10.24 and 10.85 when all three sections are read in *pari materia.* When a petition for disqualification is proper in an *inter partes* case, a petition to disqualify should be filed and no further report to the PTO is necessary.

Two comments were received discussing proposed §10.131. One comment suggested that the Director should receive a complaint from a non-practitioner only if it is "received as a public record." This suggestion is not being adopted. The investigative stage of disciplinary proceedings has been, and would continue to be, a non-public proceeding. While any practitioner may reveal to the public any complaint filed against him or her, the PTO believes that it is desirable to make a disciplinary proceeding public only when the proceeding results in a finding that a practitioner has been guilty of a violation of the PTO Code of Professional Responsibility. See *Snider* v. *Mossinghoff,* Civil Action No. 82-2903 (D.D.C. Sept. 14, 1983) (request for material related to investigation of possible patent attorney misconduct was properly denied under FOIA where attorney has not been disciplined). Another comment suggested that the Director require non-practitioners to submit complaints in the form of an affidavit or declaration. Proposed §10.131(c) is presently permissive. The suggestion is not being adopted, because there is not always a need for an affidavit. For example, disciplinary action may be based solely on PTO records. There would be no reason to require a non-practitioner to make affidavit as to the content of PTO records.

One comment was received which addressed the possibility that proposed §§10.132, 10.140, 10.155, and 10.156 as set out in the advance notice did not provide for sufficient separation of the investigative/prosecutorial functions on the one hand from the deciding functions on the other hand. Proposed §10.140 has been changed in response to this comment. The comment is addressed on the merits under the discussion above in connection with proposed §10.4.

One comment was received which suggested that proposed §10.133(b) be changed to provide for resignation from practice before the Office and that the Commissioner be authorized to enter an order excluding a practitioner "on consent." The suggestion is being adopted. In accordance with the suggestion, a practitioner would

be permitted to resign and be excluded "on consent" by filing an affidavit stating that (1) the resignation is freely and voluntarily proferred, (2) the practitioner is not acting under duress or coersion from the PTO, (3) the practitioner is fully aware of the implications of filing the resignation, and (4) the practitioner is aware of (a) a pending investigation or (b) charges arising from a complaint alleging that the practitioner is guilty of a violation of the PTO Code of Professional Responsibility. The comment contains the following statement, with which the PTO is in full accord:

> "This proposal is similar to a practice in New York and one recommended by the ABA Special Committee on Evaluation of Disciplinary Enforcement. The resignation 'on consent' serves two functions. First, it distinguishes resignations filed in the face of a pending investigation or pending charges from those filed for other reasons. *Gresham* v. *Superior Court*, 44 Cal. App. 2d 644, 112 P.2d 965 (1941). Second it informs other jurisdictions that the exclusion involved matters which may warrent their own disciplinary action. *Nolan* v. *Brawley*, 244 N.E. 2d 918 (Ind. 1969)."

One comment suggested that "alleged" be inserted before "violations" in proposed §10.134(a)(2). The suggestion is being adopted.

Two comments were received with respect to proposed §10.135(c). One comment suggested addition of "of" after "period." This suggestion is being adopted. A second comment suggested that the period for answering an inquiry under proposed §10.135(c) should be set at a minimum of 30 days. The proposed rules provide that the Director may set a period of not less than 15 days. This suggestion is not being adopted. The period of time to be set by the Director may vary depending on the location of, and the circumstances surrounding, the need for the inquiry. An attorney located in Washington, D. C. can adequately respond within 15 days. On the other hand, an attorney located on the West coast may need more time for response in view of the distance involved.

Two comments with respect to proposed §10.136 were received. One comment suggested that after "thirty days" the phase "after service" be inserted. According to the comment, the thirty- day limitation should explicitly run from a defined event. The suggestion is not being adopted, because it is contemplated that under proposed §10.136(a) a specific date will be set out in the complaint indicating the date on or before which an answer must be filed. For example, a complaint filed on Feburary 1 might indicate that "an answer is due on or before March 15." Hence, there is no need to set the thirty- day period to run from service. Another comment suggested that the language "any new matter" in proposed §10.136(e) was not definite. "Any new matter" was intended to mean any affirmative defense. Proposed §10.136(e) as it appears in this notice uses the language "any affirmative defense" in place of "any new matter."

Two comments were received which argued that approval of an ALJ should not be necessary prior to issuing a subpoena under 35 U.S.C. 24. The comments have been considered, but the suggestions made therein are not being adopted. One comment argues that "[r]equiring the granting of leave by the administrative law judge to take depositions will create many problems." On the contrary, the PTO believes that prior ALJ approval will minimize problems and will prevent (1) unwarranted issuance of subpoenas to obtain evidence which the ALJ would not consider in any instance and (2) unnecessary work on the part of federal courts. The comment states that "[i]f the administrative law judge refuses to give permission to take certain depositions, the result may very well be a long drawn-out proceeding based upon a claim by the respondent that the denial of leave by the administrative law judge was an abuse of discretion." The same argument can be made for every interlocutory order entered by an ALJ. Moreover, as in the case of a refusal by a district judge to permit a deposition, the decision by an ALJ refusing to permit a deposition may be subject to review before the Commissioner and thereafter under 35 U.S.C. 32.

The PTO agrees with the comment to the extent that it argues that "[t]he respondent [or the Director] should be permitted to . . . take whatever depositions are appropriate." The PTO disagrees with the comment, however, as to how "appropriate" is to be determined. The PTO believes that the ALJ, on motion of the respondent or Director, should make the decision of whether a subpoena should issue. The other comment suggested that "[t]he general rule governing the issuance of subpoenas in [federal] litigation should be followed." For reasons advanced above, the PTO does not presently accept this suggestion.

Four comments regarding proposed §10.139 were received. Two comments pointed out that "facts of law" in paragraph (b)(7) should be "facts or law." An appropriate change has been made. One comment suggested that the Federal Rules of Evidence should be made applicable to PTO disciplinary proceedings. This comment is discussed in connection with the comments filed with respect to §10.150. One comment suggested that the rules as proposed in the advance notice did not provide for making a record of objections to evidence and rulings on those objections. The comment argues that due process problems may be created. A change to proposed §10.150 makes clear that objections to evidence and rulings on objections will be part of the record. Another comment argued that certain stays of proceedings should be permitted. According to the argument, "[a] stay for the resolution of collateral litigation relating to allegations of misconduct would prevent the use of disciplinary proceedings as a vehicle for discovery not otherwise available in the collateral litigation." The comment does not specify what is meant by "collateral litigation." If the comment refers to allegations of fraud on the PTO by a practitioner raised in a patent infringement action, it is (and would continue to be) the *general* policy of the PTO to wait until termination of the infringement action before proceeding with disciplinary proceedings. See e.g., *Kingsland* v. *Dorsey*, 338 U.S. 318 (1949).

One comment suggested that proposed §10.141 be changed to provide that the ALJ or the Director "may provide for filing by hand or by U. S. Express Mail" papers required to be filed in disciplinary proceedings. This suggestion is being adopted. In addition to papers, proposed §10.141(c) will provide for filing papers "and other matter."

Three comments were received which discussed proposed §10.144(c). One comment pointed out that proposed §10.144(c), which provided that if a disciplinary proceeding results in disciplinary action against a practitioner, the record of the entire disciplinary proceeding will be available for public inspection, was not consistent with proposed §10.159(c), which provided that the Commissioner could order a disciplinary proceeding to be kept confidential. The added language "and subject to §10.159(c)" in proposed §10.144(c) obviates the inconsistency. It should be pointed out that the instances in which a disciplinary proceeding resulting in discipline can be ordered kept confidential will be rare. Before a file in a disciplinary proceeding may be kept confidential, a practitioner would have to demonstrate that the records in the disciplinary file fall within an exemption to the Freedom of Information Act, 5 U.S.C. 552(b). One comment asked whether settlement agreements would be made available. The language "including any settlement agreement" has been added to proposed §10.144(c) in response to the comment. One comment felt that the language "disciplinary proceeding" should be defined. The PTO has viewed the disciplinary proceeding to include the complaint and all papers filed thereafter. The PTO will continue to regard disciplinary proceedings as beginning with the filing of a complaint. Another comment suggested that keeping the record of a disciplinary proceeding closed until disciplinary action occurs is inconsistent with Standard 8.25 of the Standards for Lawyer Discipline and Disability Proceedings

of the American Bar Association (1979). The PTO has not adopted Standard 8.25. Moreover, the provisions of 35 U.S.C. 122 impose different requirements on the PTO which are not necessarily applicable to the States. A third comment suggested that the rules should provide for delaying opening of the record in a disciplinary proceeding until "collateral litigation involving allegations of the misconduct" is completed. This suggestion is not being adopted. Once a practitioner has been reprimanded, suspended or excluded by the PTO, the public is entitled to know that such action has been taken. The comment failed to state any compelling reason why the public should be precluded from knowing about disciplinary action pending resolution of some private controversy which may involve the same or similar issue.

Several comments suggested that the burden of proof in disciplinary proceedings should be specified in the rules. Some comments further suggested that the burden should be by clear and convincing evidence. The suggestion to include a rule stating the burden of proof is being adopted. Proposed §10.149 specifies that the Director shall prove his or her case by a preponderance of evidence and that a respondent shall prove any affirmative defense by a preponderance of evidence. The preponderance test has been adopted in view of *Steadman* v. *Securities and Exchange Commission*, 450 U.S. 91 (1981) and *Charlton* v. *Federal Trade Commission*, 543 F.2d 903 (D.C.Cir. 1976) which approve the use of agencies of the preponderance test. To establish a fact by preponderance of evidence means to prove that the fact is more likely so that not so. In other words, a preponderance of the evidence in a case means such evidence as, when considered and compared with that opposed to it, has more convincing force, and produces in the mind of the trier of facts that what is sought to be provided is more likely true than not true. Devitt, *Federal Jury Practice and Instructions*, §71.01 (2d Ed. 1970).

Two comments were received which suggested that objections to evidence and rulings on objections should be made part of the record. These comments are believed to have merit and have been adopted. An appropriate change to proposed §10.150(e) makes clear that objections to evidence and rulings on objections become part of the record. Several comments suggested that the PTO adopt the Federal Rules of Evidence as the rules applicable to disciplinary proceedings. The PTO pointed out in the advance notice (49 Federal Register 10020, col. 2 (Mar. 16, 1984)) that adjudications, such as a disciplinary proceeding, are not controlled by the Federal Rules of Evidence. See e.g., *Klinestiver* v. *Drug Enforcement Administration*, 606 F.2d 1128, 1130 (D.C. Cir. 1979). No comment has suggested authority which would authorize the PTO to use the Federal Rules of Evidence in disciplinary proceedings. The controlling law is set out in 5 U.S.C. 556(d) which provides in part: "Any oral or documentary evidence may be received, but the agency as a matter of policy shall provide for the exclusion of irrelevant, immaterial, or unduly repetitious evidence. A sanction may not be imposed or rule or order issued except on consideration of the whole record or those parts thereof cited by a party and supported by and in accordance with the reliable, probative, and substantial evidence." It appears to be the concern of some of the comments that the Administrative Procedure Act does not articulate an appropriate standard of evidence and that hearsay may be admitted. Suffice it to say that many adjudications occur daily under the Administrative Procedure Act, including disciplinary proceedings. The following language appearing in an opinion of the Eleventh Circuit in *TRW-United Greenfield Division* v. *National Labor Relations Board*, 716 F.2d 1391, 1394 (11th Cir. 1983), may be helpful:

> "At the hearing the ALJ refused to allow five additional employees to testify that other employees told them that such a statement had been made. TRW contends it was denied a full and fair hearing by the exclusion of this testimony. The general rule is that administrative tribunals are not bound by the strict rules of evidence governing jury trials. *Opp Cotton Mills, Inc.* v. *Administrator of Wage & Hour Div.*, 312 U.S. 126, 155, 61 S.Ct. 524, 537, 85 L.Ed. 624 (1971). Thus, the admission of testimony which would be deemed incompetent in judicial proceedings would not invalidate the administrative order. *Tagg Bros. & Moorhead* v. *United States*, 280 U.S. 420, 422, 50 S.Ct. 220, 225, 74 L.Ed. 524 (1930). But this assurance of a desired flexibility in administrative procedure does not go so far as to justify orders without a basis in evidence having rational probative force. Mere uncorroborated hearsay or rumor does not constitute substantial evidence. *Consolidated Edison Co.* v. *N.L.R.B.*, 305 U.S. 197, 230, 59 S.Ct. 206, 217, 83 L.Ed. 126 (1938). Therefore, the hearsay testimony of other employees would not have amounted to substantial evidence sufficient to support a finding for the company. We find that TRW was not denied a full and fair hearing by the judge's refusal to admit hearsay testimony."

See also *Steadman* v. *Securities and Exchange Commission*, 450 U.S. 91, 98 n. 17 (1981).

One comment argued that the Federal Rules of Evidence should apply in disciplinary cases, because the PTO is proposing to use the Federal Rules of Evidence in interference cases. See proposed 37 CFR §1.671(c) as set out in 49 Federal Register 3768, 3798 (January 30, 1984). Unlike disciplinary proceedings, interference proceedings are not governed by the Administrative Procedure Act. Thus, while 5 U.S.C. §556(d) applies to disciplinary proceedings, it does not apply to interference cases. Another comment argued that the rules of evidence in the jurisdiction in which a practitioner is located should govern PTO disciplinary proceedings. Such a provision would make it exceedingly difficult for an ALJ to rule on evidence and might make proof of a violation or proof of an affirmative defense turn on the jurisdiction where a practitioner resides. The standards for federal conduct and the evidence used to prove or defend against allegations of misconduct involving federal matters should be uniform throughout the United States. Accordingly, the argument in this comment is not being adopted.

Two comments argued that approval of the ALJ should not be required prior to taking a deposition under proposed §10.151(a). One of the two comments further argued that depositions should be taken by a respondent pursuant to the Federal Rules of Civil Procedure. The PTO is not adopting the suggestion made in these comments. The PTO believes that the taking of depositions should be left to the sound discretion of the ALJ upon motion made by the party wishing to take the deposition. Practice under the Federal Rules of Civil Procedure leaves too much control over the litigation to the parties, whereas the procedure being proposed in §10.151 leaves the ALJ in full control of the proceedings. The procedure proposed in §10.151(b) is similar to that used by the Internal Revenue Service in disciplinary proceedings under 31 U.S.C. 1026. See also 31 CFR §10.67.

Three comments regarding proposed §10.152 were received. One comment suggested that "administrative representatives" be defined. The PTO believes that the term does not need to be defined in the rules per se, but will explain the term herein for the benefit of further comment. Administrative representatives would include any PTO employee who investigates or prosecutes a disciplinary matter. The term also includes the Director, his investigative staff, and his prosecutorial staff. Two comments suggested that discovery should be commensurate with discovery authorized by the Federal Rules of Civil Procedure. The PTO is not adopting this suggestion because discovery under the Federal Rules of Civil Procedure is expensive and does not permit an ALJ to control proceedings to the extent necessary to conclude proceedings with reasonable dispatch. Discovery is not required as a matter of due process as set out in the advance notice. 49 Federal Register 10020 (March 16, 1984). No compelling rationale has been presented to date which would cause the PTO to change its views

presented in the advance notice. The PTO is receptive to further comment in response to this notice. One comment suggested that awarding costs could be a meaningful way of preventing discovery abuse. The PTO, however, has no statutory authority to award costs. While costs and attorney fees might be awarded to a prevailing respondent, there would be no authority to require a respondent who abuses discovery to pay costs.

Two changes have been made to proposed §10.154 in response to comments. The changes are discussed above. One change is editorial in nature. The other would require the ALJ to explain the reasons for any "reprimand" as well as for any suspension or exclusion. The suggestion is being adopted, because the rationale for penalties will form the basis of *stare decisis*. Indeed, one of the principal reasons for having the ALJ articulate reasons in support of penalties is to avoid the situation existing today where various penalties have been handed out, but no rationale in support of the penalties has been articulated. The lack of articulated rationale has made it more difficult to prosecute, defend, and settle disciplinary proceedings.

One comment suggested that the rules provide no vehicle for reopening disciplinary proceedings. While the PTO believes that the Commissioner has inherent authority to reopen disciplinary proceedings upon a proper showing, paragraph (c) is being added to proposed §10.155 to make explicit the authority of the Commissioner to "grant new trials." The standard is the same as that set forth in 37 CFR §1.184. Thus, the granting of a request to reopen a disciplinary proceeding will be controlled by the principles which govern the granting of new trials. Compare Rule 59 and 60 of the Federal Rules of Civil Procedure. One comment asks who will determine whether an appeal should be taken on behalf of the Director. The answer is that the Director will make that decision. In deciding to appeal to the Commissioner, the Director would not have to seek or obtain approval of the Committe on Discipline. One comment expressed the view that there might be an apperance of impropriety if appeals are to be filed with the Director since he is a party. The proposed practice is believed to be the easiest administrative manner for handling appeals. The proposed practice is similar to that which occurs with the Director of Practice of the Internal Revenue Service (31 CFR §10.71). It has presented no problem to the IRS. Accordingly, the PTO will continue to propose filing appeals in the Office of the Director. The PTO solicits further comment on this matter.

One comment voiced an objection to the Commissioner forwarding his or her decision to the Director who would in turn forward a copy of the decision to the respondent. The fifth sentence of proposed §10.156(a) has been changed to state that the Commissioner will forward a copy of the final decision to both the director and to the resondent.

Two comments were received which suggested that a stay should be automatically entered whenever a practitioner seeks judicial review of a final decision of the Commissioner. The PTO believes that stays should be entered in the discretion of the Commissioner. Accordingly, the suggestion is being adopted to the extent that a paragraph (b) has been added to proposed §10.157 to give the Commissioner discretion to enter stay orders. Whether a stay would be entered would depend on the particular facts. For example, it is unlikely that any stay would be entered where the practitioner has been found guilty of a violation of the PTO Code of Professional Responsibility *and* is presently incarcerated.

Three comments were received which addressed proposed §10.158. This section is designed to set out, for the first time, the restrictions on suspended or excluded practitioners. The present intent of the PTO is to effect the maximum lawful isolation of a suspended or excluded practitioner from the practice of law before the PTO. The PTO is attempting to do so through §10.158. One comment suggested that a suspended or excluded practitioner should be required to notify the bars of which he or she is a member of the fact of the PTO suspension or exclusion. The PTO believes this comment has merit. The language "bars of which he or she is a member" would include the bar of a State and the bar of a federal court, such as the Supreme Court, the United States Court of Appeals for the Federal Circuit, and any other federal court bar in which the suspended or excluded practitioner is a member. One comment believed that the firm of a suspended or excluded practitioner would have to give up its clients when the practitioner is suspended or excluded. That was not the intent of proposed §10.158. Nevertheless, proposed §10.158(b)(1) has been changed to make clear that a suspended or excluded practitioner must notify his or her clients. The clients of other members of the firm would not have to be notified. The same comment felt that the PTO was attempting to preclude a suspended or excluded practitioner from appearing before State courts. Such was not, and is not, the intent of the PTO. See the preamble to proposed §10.1. One comment suggested insertion of the words "by a final decision" after the word "Office" in proposed §10.158(a) and (b). This suggestion is not being adopted. The provisions of proposed §10.158 would apply unless a stay is granted by the Commissioner under proposed §10.157(b). The same comment suggested eliminating the word "law" or "legal" from subparagraphs (b)(3), (b)(5), (b)(6), and (b)(7). This suggestion is not being adopted. The comment would apparently have the Commissioner exlude from any contact with the PTO a practitioner who is suspended or excluded. The PTO does not belive the Commissioner has authority to do so. For example, a suspended or excluded practitioner could deliver a paper to the PTO. Hence, what the PTO proposes to do is prevent a suspended or exluded practitioner from practicing law before the Office or from rendering *legal* services to those having immediate, actual, or prospective business before the PTO. The comment went on to suggest that paragraphs (c) and (d) should be deleted, arguing that a suspended or excluded practitioner should not be permitted to do what is authorized in the paragraphs. The PTO perceives that suspended and excluded practitioners are entitled—like other citizens—to do certain things. Proposed §10.158 sets out what a suspended or excluded practitioner may do without running the risk of being denied readmission after a suspension. The comment failed to address the holdings of the various cases cited in the advance notice, 49 Federal Register at 10021, second and third columns. One comment discussed proposed §10.158 extensively. The comment has been considered in its entirety, but none of the suggestions made therein are being adopted. The comment argued that "in any way" in proposed §10.158(c) might prevent a suspended partner from buying paper for the firm. Such is not the intent of the proposed rule inasmuch as it merely prevents a suspended or excluded practitioner from aiding another in the *practice of law* before the Office. The comment states that it would be impossible for a suspended or excluded practitioner to avoid discussions with clients and witnesses. The PTO does not agree. If the comment were correct, disqualification of all members of a firm would occur every time an associate is disqualified. However, "Chinese Walls" can be erected. The point is, when a practitioner is suspended or excluded and the practitioner is a member of a firm, the firm will have to decide whether to retain the suspended or excluded practitioner with appropriate insulation from PTO clients or whether to effect a separation. The comment also argued that the PTO was attempting to preclude a suspended or excluded practitioner from practicing State law. As pointed out above, such is not the case. The comment states that when a partner of a firm is suspended or excluded there are many contractual and economic ties between the partners which will make compliance with proposed §10.158 difficult. The PTO appreciates the difficulty which may in fact result. However, such is the fate of a firm in which a member is suspended or disbarred. Similar contractual and economic ties are disrupted when a State disbars a member of a firm. The argument is also made that a contract may

prevent a firm or professional corporation from making a partner or majority stockholder an employee. What happens when a State bar suspends such a partner or majority stockholder? Fortunately, most partnerships and professional corporations do not encounter a need to deal with some of the difficult issues raised in the comment. However, when a suspension or exclusion occurs, business cannot be permitted to go on as usual. Those who are suspended cannot represent others, directly or indirectly, in their patent, trademark, and other legal business before the PTO.

One comment suggested that "the practitioner" in the second sentence of proposed §10.159(b) be changed to "any practitioner." The suggestion is being adopted. Another comment suggested that proposed §10.159(a) should be amended to insert after "be" the language "or have been." The suggestion is not being adopted in view of the change to proposed §10.158(b)(1).

With respect to proposed §10.160(d) one comment made the following statement: "That's no punishment! In this situation, it would seen to me that the period of actual suspension should be at least significantly greater than the initial period which the suspended practitioner failed to honor." Proposed §10.160(d) is believed to give the Director discretion in considering an application for readmission by a suspended or excluded practitioner and to take into account any activity in which a suspended or excluded practitioner may have engaged. If a suspended or excluded practitioner has violated proposed §10.158, he or she will not be readmitted until an appropriate suspension or exclusion has taken place. If the Director is of the opinion that a longer suspension is in order, he may deny the application for readmission and the suspended or excluded practitioner may seek review to the Commissioner under proposed §10.2(c).

Table 1
Principal Source of Sections 10.2 through 10.19

Sec.	
10.2(a)	New
10.2(b)(1)	New, but see 37 CFR 1.341(i) (1983)
10.2(b)(2)	New, but see 37 CFR 1.348(a) (1983)
10.2(c)	New, but see 37 CFR 1.341(i) (1983)
10.3	37 CFR 1.341(i) (1983)
10.4(a)	New
10.4(b)	New, but see 37 CFR 1.348(a) (1983)
10.4(c)	New
10.5	37 CFR 1.341 (1983)
10.6(a)	37 CFR 1.341(a) (1983)
10.6(b)	37 CFR 1.341(b) (1983)
10.6(c)	37 CFR 1.341(e) (1983)
10.6(d)	37 CFR 1.341(f) (1983)
10.6(e)	37 CFR 1.341(g) (1983)
10.7(a), (b)	37 CFR 1.341(c) (1983)
10.7(c)	New
10.8	37 CFR 1.341(h) (1983)
10.9(a)	37 CFR 1.342(1983)
10.9(b)	New
10.10	37 CFR 1.343 (1983)
10.11	37 CFR 1.347 (1983)
10.12	[reserved]
10.13	[reserved]
10.14	5 USC 500(b) and 37 CFR 2.12 (1983)
10.15	35 USC 32; 5 USC 500(d)(2); 37 CFR 1.343 (1983); and 37 CFR 2.12(f) (1983)
10.16	[reserved]
10.17	[reserved]
10.18(a)	37 CFR 1.346 (1983) and 37 CFR 2.15 (1983), see also Rule 11, FRCP
10.18(b)	35 USC 32 & Rule 11, FRCP
10.19	[reserved]

Table 2
Principal Source of Sections of 10.20 through 10.112, the PTO Code of Professional Responsibility

Abbreviations:
FRCP means Federal Rules of Civil Procedure
MCPR means Model Code of Professional Responsibility of the ABA (1980)
MRPC means Model Rules of Professional Conduct of the ABA (1983)
VCPR means the Virginia Code of Professional Responsibility (1984)

Sec.	
10.20	Preamble to MCPR (1980)
10.21	MCPR Canon 1 (1980)
10.22	MCPR DR 1-101 (1980)
10.23(a)	35 U.S.C. 32
10.23(b)(1)	35 U.S.C. 32 and MCPR DR 1-102(A)(1) (1980)
10.23(b)(2)–(6)	MCPR DR 1-102(A)(2)-(6) (1980)
10.23(c)(1)–(14)	PTO created
10.23(c)(15)	Rule 11, FRCP
10.23(c)(16)–(18)	PTO created
10.23(d)	*U.S.* v. *Beecroft*, 608 F.2d 753 (9th Cir. 1979)
10.24	MCPR 1-103 (1980)
10.25 through 10.29	(reserved)
10.30	MCPR Canon 2 (1980)
10.31(a)	35 U.S.C. 32
10.31(b)	5 U.S.C. 501
10.31(c)	37 CFR 1.345(c) (1983)
10.31(d)	Newly created
10.32	MRPC Rule 7.2 (1983)
10.33	MRPC Rule 7.3 (1983)
10.34	MRPC Rule 7.4 (1983)
10.35(a)	5 U.S.C. 501 and MRPC Rule 7.5 (1983)
10.35(b)	MRPC Rule 7.5 (1983)
10.36	MCPR DR 2-106 (1980)
10.37	MCPR DR 2-107 (1980)
10.38	MCPR DR 2-108 (1980)
10.39	MCPR DR 2-109 (1980)
10.40	MCPR DR 2-110 (1980)
10.41 through 10.45	(reserved)
10.46	MCPR Canon 3 (1980)
10.47(a), (c)	MCPR DR 3-101 (1980)
10.47(b)	New (but see e.g., *Crawford* v. *State Bar of California*, 7 Cal. Rptr. 746, 355 P.2d 490 (Cal. 1960))
10.48	MCPR DR 3-102 (1980)
10.49	MCPR DR 3-103 (1980)
10.50 through 10.55	(reserved)
10.56	MCPR Canon 4 (1980)
10.57	MCPR DR 4-101 (1980)
10.58 through 10.60	(reserved)
10.61	MCPR Canon 5 (1980)
10.62	MCPR DR 5-101 (1980)
10.63	MCPR DR 5-102 (1980)
10.64	MCPR DR 5-103 (1980)
10.65	MCPR DR 5-104 (1980)
10.66	MCPR DR 5-105 (1980)
10.67	MCPR DR 5-106 (1980)
10.68	MCPR DR 5-107 (1980)
10.69 through 10.75	(reserved)
10.76	MCPR Canon 6 (1980)
10.77	MCPR DR 6-101 (1980)
10.78	MCPR DR 6-102 (1980)
10.79 through 10.82	(reserved)
10.83	MCPR Canon 7 (1980)
10.84	MCPR DR 7-101 (1980)
10.85	MCPR DR 7-102 (1980)
10.86	(reserved)
10.87	MCPR DR 7-104 (1980)
10.88	MCPR DR 7-105 (1980)
10.89	MCPR DR 7-106 (1980)

Table 2 (cont.)

10.90	(reserved)
10.91	(reserved)
10.92	MCPR DR 7-109 (1980)
10.93	VCPR DR 7-109 (1984)
10.94 through 10.99	(reserved)
10.100	MCPR Canon 8 (1980)
10.101(a)	MCPR DR 8-101 (1980)
10.101(b)	37 CFR 1.341(f) (1983) and 41 Op. Att'y Gen. 21 (1949), *reprinted in* 1949 Dec. Comm'r. Pat. 1
10.102	MCPR DR 8-102 (1980)
10.103	MCPR DR 8-103 (1980)
10.104 through 10.109	(reserved)
10.110	MCPR Canon 9 (1980)
10.111	MCPR DR 9-101 (1980)
10.112	MCPR DR 9-102 (1980)

Table 3

Principal Source of Sections 10.130 through 10.161

Section	*Source*
10.130	35 U.S.C. 32
10.131 (a)	New, but see 37 CFR 1.348(a)
10.131(b)	MCPR DR 1-103 (1980)
10.131(c)	New
10.132(a), (c)	New
10.132(b)	New, but see 37 CFR 1.348(b) (1983)
10.133	New
10.134	37 CFR 1.348(b) (1983)
10.135(a)(1)	New
10.135(a)(2)	37 CFR 1.348(b) (1983)
10.135(a)(3)	New
10.135(b)	New
10.135(c)	New
10.135(d)	5 USC 500(f)
10.136(a)	37 CFR 1.348(c) (1983)
10.136(b)	New
10.136(c)	37 CFR 1.348(c) (1983)
10.136(d)	37 CFR 1.348(c) (1983)
10.136(e)	New
10.137	37 CFR 1.348(c) (1983)
10.138	New
10.139(a)	5 USC 3105
10.139(b)	5 USC 556(c)
10.139(c)	New
10.139(d)	New
10.139(e)	New
10.140(a)	5 USC 500(b)
10.140(b)	New
10.141	New
10.142	New
10.143	New
10.144	New
10.145	New
10.146-10.148	[reserved]
10.149	New, see *Steadman* v. *SEC*, 450 U.S. 91 (1981)
10.150(a)	5 USC 556(d)
10.150(b)	37 CFR 1.348(d)(3) (1983)
10.150(c)	New
10.150(d)	New
10.150(e)	New
10.151	37 CFR 1.348(d)(3) (1983)
10.152	New, see *Silverman* v. *CFTC*, 549 F.2d 28 (7th Cir. 1977)
10.153	New, but see 5 USC 557(c)
10.154	See 5 USC 557(b) and 35 USC 32
10.155	New
10.156	New
10.157	35 USC 32, Local Rule 1-26 (D.D.C.)
10.158	New
10.159	New
10.160	New
10.161	New
10.162-10.169	[reserved]
10.170	New, but see 37 CFR 1.183

Other Considerations: The proposed rules will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The proposed rules are in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354) and Executive Order 12291.

The General Counsel of the Department of Commerce has certified to the Small Business Administration that the proposed rules will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, Pub. L. 96-354). The proposed rules would regulate the conduct of attorneys and agents who represent individuals and juristic entities before the Patent and Trademark Office and, if adopted, the proposed rules would not be expected to result in an increase of fees charged by attorneys and agents to entities, including small entities.

The Patent and Trademark Office has determined that the proposed rules are not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The registration information reporting requirements contained in the proposed rules, have been approved by the Office of Management and Budget, OMB Control No. 0651-0010.

The collection of information requirement for preserving client records, and identity of client' funds and property, contained in the proposed rules, is being submitted to OMB for review under Section 3504(h) of the Paperwork Reduction Act. Direct comments relating to this requirement to the Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for Commerce, Patent and Trademark Office. List of Subjects in 37 CFR Parts 1, 2, and 10

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Trademarks, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, 31 and 41, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations as set forth bellow:

It is proposed to amend 37 CFR, Chapter 1, as follows wherein deletions are indicated by brackets and additions by arrows:

Part 1—Rules of Practice in Patent Cases

1. Section 1.8 is proposed to be amended by adding to paragraph (a) a new subparagraph (xii) to read as follows:

§1.8 Certificate of mailing.

(a) • • •

(xii) Papers filed in connection with a disciplinary proceeding under Part 10 of this Subchapter.

Section 1.21 is proposed to be amended by adding to paragraph (a) two new paragraphs (5) and (6) to read as follows:

§1.21 Miscellaneous fees and charges.

(a) • • •

(5) For review of a decision of the Director of Enrollment and Discipline under §10.2(c) 60.00

(6) For requesting regrading of an examination under §19.7(c) $60.00

3. Section 1.31 is proposed to be revised to read as follows:

§1.31 Applicants may be represented by [an] ►a registered◄ attorney or agent.

An applicant for patent may file and prosecute his ► or her ◄ own case, or he ►or she◄ may be represented by [an] ►a registered◄ attorney ►, ◄ [or] agent, ►or other individual◄ authorized to practice before the Patent and Trademark Office in patent cses. ►See § §10.6 and 10.9 of this Subchapter. ◄The Patent and Trademark Office cannot aid in the selection of [an] ►a registered◄ attorney or agent.

4. Section 1.34 is proposed to be amended by revising paragraph (a) as follows:

§1.34 Recognition of representation.

(a) When a registered attorney or agent acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a patent case, his or her personal appearance or signature shall constitute a representation to the Patent and Trademark Office that under the provisions of this [part] ►Subchapter◄ and the law, he or she is authorized to represent the particular party in whose behalf he or she acts. In filing such a paper, the ►registered◄ attorney or agent should specify his or her registration number with his or her signature. Further proof of authority to act in a representative capacity may be required.

* * * * *

5. The center heading preceding §1.341 is proposed to be deleted.

6. Sections 1.341 through 1.348 are proposed to be deleted.

Part 2—Rules of Practice in Trademark Cases

7. Section 2.11 is proposed to be revised to read as follows:

§2.11 Applicants may be represented by an attorney.

The owner of a trademark may file and prosecute his ►or her◄ own application for registration of such trademark, or he ►or she◄ may be represented by an attorney or other [person] ►individual◄ authorized to practice in trademark cases ►under §10.14 of this Subchapter◄. The Patent and Trademark Office cannot aid in the selection of an attorney or other representative.

8. Sections 2.12 through 2.16 are proposed to be deleted.

9. Section 2.17 is proposed to be amended by revising paragraph (a) as follows:

§2.17 Recognition for representation.

(a) When an attorney [at law] ►as defined in §10.1(c) of this Subchapter◄ acting in a representative capacity appears in person or signs a paper in practice before the Patent and Trademark Office in a trademark case, his ► or her◄ personal appearance or signature shall constitute a representation to the Patent and Trademark Office that ►,◄ under the provisions of [these rules] ►§10.14 ◄ and the law ►,◄ he ►or she◄ is authorized [, and qualified under §2.12(a),] particular party in whose behalf he ►or she◄ acts. Further proof of authority to act in a representative capacity may be required.

* * * * *

10. Section 2.19 is proposed to be revised to read as follows:

§2.19 Revocation of power of attorney or of other authorization to represent ►,withdrawal◄.

►(a)◄ Authority to represent an applicant or a party to a proceeding may be revoked at any stage in the proceedings of a case upon notification to the Commissioner; and when it is so revoked, the Office will communicate directly with the applicant or party to the proceeding or with such other qualified person as may be authorized. The Patent and Trademark Office will notify the person affected of the revocation of his ►or her◄ authorization.

►(b) An individual authorized to represent an applicant or party in a trademark case may withdraw upon application to and approval by the Commissioner.◄

11. The following Part 10 is proposed to be added:

Part 10—Representation of others before the Patent and Trademark Office

Sec.

10.1	Definitions.
10.2	Director of Enrollment and Discipline.
10.3	Committee on Enrollment.
10.4	Committee on Discipline.
10.5	Register of attorneys and agents in patent cases.
10.6	Registration of attorneys and agents.
10.7	Requirements for registration.
10.8	Oath and registration fee.
10.9	Limited recognition in patent cases.
10.10	Individuals not registered or recognized to practice in patent cases.
10.11	Removing names from the register.
10.12-10.13	[reserved].
10.14	Individuals who may practice before the Office in trademark and other non-patent cases.
10.15	Refusal to recognize a practitioner.
10.16-10.17	[reserved].
10.18	Signature and certificate of practitioner.
10.19	[reserved].
10.20	Canons and Disciplinary Rules.
10.21	Canon 1.
10.22	Maintaining integrity and competence of the legal profession.
10.23	Misconduct.
10.24	Disclosure of information to authorities.
10.25-10.29	[reserved].
10.30	Canon 2.
10.31	Communications concerning a practitioner's services.
10.32	Advertising.
10.33	Direct contact with prospective clients.
10.34	Communication of fields of practice.
10.35	Firm names and letterheads.
10.36	Fees for legal services.
10.37	Division of fees among practitioners.
10.38	Agreements restricting the practice of a practitioner.
10.39	Acceptance of employment.
10.40	Withdrawal from employment.
10.41-10.45	[reserved].
10.46	Canon 3.
10.47	Aiding unauthorized practice of law.
10.48	Sharing legal fees.
10.49	Forming a partnership with a non-practitioner.
10.50-10.55	[reserved].
10.56	Canon 4.
10.57	Preservation of confidence and secrets of a client.
10.58 -10.60	[reserved].
10.61	Canon 5.
10.62	Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment.
10.63	Withdrawal when the practitioner becomes a witness.
10.64	Avoiding acquisition of interest in litigation or proceeding before the Office.
10.65	Limiting business relations with a client.
10.66	Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner.
10.67	Settling similar claims of clients.

10.68	Avoiding influence by others than the client.
10.69-10.75	[reserved].
10.76	Canon 6.
10.77	Failing to act competently.
10.78	Limiting liability to client.
10.79-10.82	[reserved].
10.83	Canon 7.
10.84	Representing a client zealously.
10.85	Representing a client within the bounds of the law.
10.86	[reserved].
10.87	Communicating with one of adverse interest.
10.88	Threatening criminal prosecution.
10.89	Conduct in proceedings.
10.90-10.91	[reserved].
10.92	Contact with witnesses.
10.93	Contact with officials.
10.94-10.99	[reserved].
10.100	Canon 8.
10.101	Action as a public official.
10.102	Statements concerning officials.
10.103	Practitioner candidate for judicial office.
10.104-10.109	[reserved].
10.110	Canon 9.
10.111	Avoiding even the appearance of impropriety.
10.111	Preserving identity of funds and property of client.
10.113-10.129	[reserved].
10.130	Reprimand, suspension or exclusion.
10.131	Investigations.
10.132	Initiating a disciplinary proceeding; reference to an administrative law judge.
10.133	Conference between Director and practitioner; resignation.
10.134	Complaint.
10.135	Service of complaint.
10.136	Answer to complaint.
10.137	Supplemental complaint.
10.138	Contested case.
10.139	Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays.
10.140	Representative for Director of respondent.
10.141	Filing of papers.
10.142	Service of papers.
10.143	Motions.
10.144	Hearings.
10.145	Proof; variance; amendment of pleadings.
10.146-10.148	[reserved].
10.149	Burden of proof.
10.150	Evidence.
10.151	Depositions.
10.152	Discovery.
10.153	Proposed findings and conclusions; post-hearing memorandum.
10.154	Initial decision of administrative law judge.
10.155	Appeal to the Commissioner.
10.156	Decision of the Commissioner.
10.157	Review of Commissioner's final decision.
10.158	Suspended or excluded practitioner.
10.159	Notice of suspension or exclusion.
10.160	Petition for reinstatement.
10.161	Savings clause.
10.162-10.169	[reserved].
10.170	Suspension of rules.

Authority: 5 U.S.C. 500, 35 U.S.C. 6, 31, 32

Part 10 —Representation of others before the Patent and Trademark Office

§10.1 Definitions

This part governs solely the practice of patent, trademark, and other law before the Patent and Trademark Office. Nothing in this subpart shall be construed to preempt the authority of each State to maintain control over the practice of law within its borders, except to the extent necessary for the Patent and Trademark Office to accomplish its federal objectives. Unless otherwise clear from the context, the following definitions apply to this part:

(a) "Affidavit" means affidavit, declaration under 35 U.S.C. 25 (see §1.68 and §2.20 of this Subchapter), or statutory declaration under 28 U.S.C. 1746.

(b) "Application" includes an application for a design, plant, or utility patent, an application to reissue any patent, and an application to register a trademark.

(c) "Attorney" or "lawyer" means an individual who is a member in good standing of the bar of any United States court or the highest court of any State. A "non-lawyer" is a person who is not an attorney or lawyer.

(d) "Canon" is defined in §10.20(a).

(e) "Confidence" is defined in §10.57(a).

(f) "Differing interests" include every interest that may adversely affect either the judgment or the loyalty of a practitioner to a client, whether it be a conflicting, inconsistent, diverse, or other interest.

(g) "Director" means the Director of Enrollment and Discipline.

(h) "Disciplinary Rule" is defined in §10.20(b).

(i) "Employee of a tribunal" includes all employees of courts, the Office, and other adjudicatory bodies.

(j) "Giving information" within the meaning of §10.23(c)(2) includes making (1) a written statement or representation or (2) an oral statement or representation.

(k) "Law firm" includes a professional legal corporation or a partnership.

(l) "Legal counsel" means practitioner.

(m) "Legal profession" includes the individuals who are lawfully engaged in practice of patent, trademark, and other law before the Office.

(n) "Legal service" means any legal service which may lawfully be performed by a practitioner before the Office.

(o) "Legal System" includes the Office and courts and adjudicatory bodies which review matters on which the Office has acted.

(p) "Office" means Patent and Trademark Office.

(q) "Person" includes a corporation, an association, a trust, a partnership, and any other organization or legal entity.

(r) "Practitioner" means (1) an attorney or agent registered to practice before the Office in patent cases or (2) an individual authorized under 5 U.S.C. 500(b) or otherwise as provided by this Subchapter, to practice before the Office in trademark cases or other non-patent cases. A "suspended or excluded practitioner" is a practitioner who is suspended or excluded under §10.156. A "non-practitioner" is an individual who is not a practitioner.

(s) A "proceeding before the Office" includes an application, a reexamination, a protest, a public use proceeding, a patent interference, an *inter partes* trademark proceeding, or any other proceeding which is pending before the Office.

(t) "Professional legal corporation" means a corporation, authorized by law to practice law for profit.

(u) "Registration" means registration to practice before the Office in patent cases.

(v) "Respondent" is defined in §10.134(a)(1).

(w) "Secret" is defined in §10.57(a).

(x) "Solicit" is defined in §10.33.

(y) "State" includes the District of Columbia, Puerto Rico, and other federal territories and possessions.

(z) "Tribunal" includes courts, the Office, and other adjudicatory bodies.

(aa) "United States" means the United States of

America, its territories and possessions.

§10.2 Director of Enrollment and Discipline.

(a) *Appointment.* The Commissioner shall appoint a Director of Enrollment and Discipline. In the event of the absence of the Director or a vacancy in the office of the Director, the Commissioner may designate an employee of the Office to serve as acting Director of Enrollment and Discipline. The Director and any acting Director shall be an active member in good standing of the bar of a State.

(b) *Duties.* The Director shall:

(1) Receive and act upon applications for registration, prepare and grade the examination provided for in §10.7(b), maintain the register, and perform such other duties in connection with enrollment and recognition of attorneys and agents as may be necessary.

(2) Conduct investigations into possible violations by practitioners of Disciplinary Rules, with the consent of the Committee on Discipline initiate disciplinary proceedings under §10.132(b), and perform such other duties in connection with investigations and disciplinary proceedings as may be necessary.

(c) *Review of Director's decision.* Any final decision of the Director refusing to register an individual under §10.6, recognize an individual under §§10.9 or 10.14(c), or reinstate a suspended or excluded petitioner under §10.160, may be reviewed by petition to the Commissioner upon payment of the fee set forth in §1.21(a)(5). A petition filed more than 30 days after the date of the decision of the Director may be dismissed as untimely. Any petition shall contain (1) a statement of the facts involved and the points to be reviewed and (2) the action requested. Briefs or memoranda, if any, in support of the petition shall accompany or be embodied therein. The petition will be decided on the basis of the record made before the Director and no new evidence will be considered by the Commissioner in deciding the petition. Copies of documents already of record before the Director shall not be submitted with the petition. An oral hearing on the petition will not be granted except when considered necessary by the Commissioner.

(OMB Control No. 0651-0010).

§10.3 Committee on Enrollment.

(a) The Commissioner may establish a Committee on Enrollment composed of one or more employees of the Office

(b) The Committee on Enrollment shall, as necessary, advise the Director in connection with the Director's duties under §10.2(b)(1).

§10.4 Committee on Discipline.

(a) The Commissioner shall appoint a Committee on Discipline. The Committee on Discipline shall consist of the at least three employees of the Office, none of whom reports directly or indirectly to the Director or the Solicitor. Each member of the Committee on Discipline shall be a member in good standing of the bar of a State.

(b) The Committee on Discipline shall meet at the request of the Director and after reviewing evidence presented by the Director shall, by majority vote, determine whether there is probable cause to bring charges under §10.132 against a practitioner. When charges are brought against a practitioner, no member of the Committee on Discipline, employee under the direction of the Director, or associate solicitor or assistant solicitor in the Office of the Solicitor shall participate in rendering a decision on the charges.

(c) No discovery shall be authorized of, and no member of the Committee on Discipline shall be required to testify about, deliberations of the Committee on Discipline.

Individuals Entitled to Practice Before the Patent and Trademark Office Office

§10.5 Register of attorneys and agents in patent cases.

A register of attorneys and agents is kept in the Office on which are entered the names of all individuals recognized as entitled to represent applicants before the Office in the preparation and prosecution of applications for patent. Registration in the Office under the provisions of this part shall only entitle the individuals registered to practice before the Office in patent cases.

§10.6 Registration of attorneys and agents.

(a) *Attorneys.* Any citizen of the United States who is an attorney and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office. When appropriate, any alien who is an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent attorney to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States and *further provided:* the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registration does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also §10.9(b).

(b) *Agents.* Any citizen of the United States who is not an attorney and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office. When appropriate, any alien who is not an attorney, who lawfully resides in the United States, and who fulfills the requirements of this part may be registered as a patent agent to practice before the Office, *provided:* registration is not inconsistent with the terms upon which the alien was admitted to, and resides in, the United States, and *further provided*: the alien may remain registered only (1) if the alien continues to lawfully reside in the United States and registration does not become inconsistent with the terms upon which the alien continues to lawfully reside in the United States or (2) if the alien ceases to reside in the United States, the alien is qualified to be registered under paragraph (c) of this section. See also §10.9(b).

Note: All individuals registered prior to November 15, 1938, were registered as attorneys, whether they were attorneys or not, and such registrations have not been changed.

(c) *Foreigners.* Any foreigner not a resident of the United States who shall file proof to the satisfaction of the Director that he or she is registered and in good standing before the patent office of the country in which he or she resides and practices and who is possessed of the qualifications stated in §10.7, may be registered as a patent agent to practice before the Office for the limited purpose of presenting and prosecuting patent applications of applicants located in such country, *provided*: the patent office of such country allows substantially reciprocal privileges to those admitted to practice before the United States Patent and Trademark Office. Registration as a patent agent under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.

(d) *Government employees.* Any officer or employee of the United States who is disqualified by statute (18 U.S.C. 203, 205) from practicing as an attorney or agent in proceedings or other matters before Government departments or agencies, may not be registered to practice before the Office. If any registered attorney or agent becomes an officer or employee of the United States who is disqualified by statute from practicing as an attorney or agent in proceedings and other matters before Government departments or agencies, his or her name shall be endorsed as inactive on the register during the period of any employment by the United States. An officer or employee of the United States whose official duties require the preparation and prosecution of applications for patent and who fulfills the requirements of this part may be registered to practice before the Office to the extent necessary to carry out his or her official duties. A written statement describing the official duties of the officer or employee and signed on behalf of the agency

employing the officer or employee may be required by the Director.

(e) *Former Office employees.* No individual who has served in the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written statement indicating that he or she has read 18 U.S.C. 207. No individual who has served in the patent examining corps of the Office will be registered after termination of his or her services, nor if registered before such service, be reinstated, unless he or she signs a written undertaking (1) not to prosecute or aid in any manner in the prosecution of any patent application pending in any patent examining group during his or her period of service therein and (2) not to prepare or prosecute or to assist in any manner in the preparation or prosecution of any patent application of another (i) assigned to such group for examination and (ii) filed within two years after the date he or she left such group, without written authorization of the Director. Associated and related classes in other patent examining groups may be required to be included in the undertaking or designated classes may be excluded from the undertaking. When an application for registration or reinstatement is made after resignation from the Office, the applicant will not be registered or reinstated if he or she has prepared or prosecuted or assisted in the preparation or prosecution of any any patent application as indicated in this paragraph.

(OMB Control No. 0651-0010)

§10.7 Requirements for registration.

(a) No individual will be registered to practice before the Office unless he or she shall:

(1) apply to the Commissioner in writing on a form supplied by the Director and furnish all requested information and material and

(2) establish to the satisfaction of the Director that he or she is:

(i) of good moral character and repute;

(ii) possessed of the legal, scientific, and technical qualifications necessary to enable him or her to render applicants for patents valuable service; and

(iii) is otherwise competent to advise and assist applicants for patents in the presentation and prosecution of their applications before the Office.

(b) In order that the Director may determine whether an individual seeking to have his or her name placed upon the register has the qualifications specified in paragraph (a) of this section, satisfactory proof of good moral character and repute and of sufficient basic training in scientific and technical matters must be submitted to the Director.

Except as provided in this paragraph, each applicant for registration must take and pass an examination which is held from time to time. Each application for admission to take the examination for registration must be accompanied by the fee set forth in §1.21(a)(1) of this Subchapter. The taking of an examination may be waived in the case of any individual who has actively served for at least four years in the examining corps of the Office. The examination will not be administered as a mere academic exercise.

(c) Within two months from the date an applicant is notified that he or she failed an examination, the applicant may request regrading of the examination upon payment of the fee set forth in §1.21(a)(6). Any applicant requesting regrading shall particularly point out the errors which the applicant believed occurred in the grading of his or her examination.

(OMB Control No. 0651-0010).

§10.8 Oath and registration fee.

Before an individual may have his or her name entered on the register of attorneys and agents, the individual must, after his or her application is approved, subscribe and swear to an oath or make a declaration prescribed by the Commissioner and pay the registration fee set forth in §1.21(a)(2) of this Subchapter.

(OMB Control No. 0651-0010)

§10.9 Limited recognition in patent cases.

(a) Any individual not registered under §10.6 may, upon a showing of circumstances which render it necessary or justifiable, be given limited recognition by the Director to prosecute as attorney or agent a specified application or specified applications, but limited recognition under this paragraph shall not extend further than the application or applications specified.

(b) When registration of an alien under paragraphs (a) or (b) of §10.6 is not appropriate, the alien may be given limited recognition as may be appropriate under paragraph (a) of this section.

§10.10 Individuals not registered or recognized to practice in patent cases.

Only practitioners who are registered under §10.6 or individuals given limited recognition under §10.9 will be permitted to prosecute patent applications of others before the Office.

§10.11 Removing names from the register.

(a) Registered attorneys and agents shall notify the Director of any change of address. Any notification to the Director of any change of address shall be separate from any notice of change of address filed in individual applications.

(b) A letter may be addressed to any individual on the register, at the address of which separate notice was last received by the Director, for the purpose of ascertaining whether such individual desires to remain on the register. The name of any individual failing to reply and give any information requested by the Director within a time limit specified will be removed from the register and the names of individuals so removed will be published in the *Official Gazette.* The name of any individual so removed may be reinstated on the register as may be appropriate and upon payment of the fee set forth in §1.21(a)(3) of this Subchapter.

(OMB Control No. 0651-0010)

§§10.12-10.13 [reserved].

§10.14 Individuals who may practice before the Office in trademark and other non-patent cases.

(a) *Attorneys.* Any individual who is an attorney may represent others before the Office in trademark and other non-patent cases. An attorney is not required to apply for registration or recognition to practice before the Office in trademark and other non-patent cases.

(b) *Non-lawyers.* Individuals who are not attorneys are not recognized to practice before the Office in trademark and other non-patent cases, except that individuals not attorneys who were recognized to practice before the Office in trademark cases under this chapter prior to January 1, 1957, will be recognized as agents to continue practice before the Office in trademark cases.

(c) *Foreigners.* Any foreigner not a resident of the United States who shall prove to the satisfaction of the Director that he or she is registered and in good standing before the patent or trademark office of the country in which he or she resides and practices, may be recognized for the limited purpose of representing applicants located in such country before the Office in the presentation and prosecution of trademark applications, *provided:* the patent and trademark office of such country allows substantially reciprocal privileges to those permitted to practice in trademark cases before the United States Patent and Trademark Office. Recognition under this paragraph shall continue only during the period that the conditions specified in this paragraph obtain.

(d) Recognition of any individual under this section shall not be construed as sanctioning or authorizing the performance of any act regarded in the jurisdiction where performed as the unauthorized practice of law.

(e) No individual other than those specified in paragraphs (a), (b), and (c) of this section will be permitted to practice before the Office in trademark cases. Any individual may appear in a trademark or other non-patent case in his or her own behalf. Any individual may appear in a trademark, case for (1) a firm of which he or

she is a member or (2) a corporation or association of which he or she is an officer and which he or she is authorized to represent, if such firm, corporation, or association is a party to a trademark proceeding pending before the Office.

§10.15 Refusal to recognize a practitioner.

Any practitioner authorized to appear before the Office may be suspended or excluded in accordance with the provisions of this part. Any practitioner who is suspended or excluded under this subpart or removed under §10.11(b) shall not be entitled to practice before the Office.

§§10.16-10.17 [reserved].

§10.18 Signature and certificate of practitioner.

(a) Every paper filed by a practitioner representing an applicant or party to a proceeding in the Office must bear the signature of, and be personally signed by, such practitioner except those papers which are required to be signed by the applicant or party. The signature of practitioner to a paper filed by him or her, constitutes a certificate that:

(1) the paper has been read;

(2) the paper's filing is authorized;

(3) to the best of his or her knowledge,

information, and belief, there is good ground to support the paper, including any allegations of improper conduct contained or alleged therein; and

(4) it is not interposed for delay.

(b) Any practitioner knowingly violating the provisions of this section is subject to disciplinary action. See §10.23(c)(15).

§[10.19 reserved].

Patent and Trademark Office Code of Professional Responsibility

§10.20 Canons and Disciplinary Rules.

(a) Canons are set out in §§10.21, 10.30, 10.46, 10.56, 10.61, 10.76, 10.83, 10.100, and 10.110. Canons are statements of axiomatic norms, expressing in general terms the standards of professional conduct expected of practitioners in their relationships with the public, with the legal system, and with the legal profession.

(b) Disciplinary Rules are set out in §§10.22-10.24, 10.31-10.40, 10.47-10.57, 10.62-10.68, 10.77, 10.78, 10.84, 10.85, 10.87-10.89, 10.92, 10.93, 10.101-10.103, 10.111, and 10.112. Disciplinary Rules are mandatory in character and state the minimum level of conduct below which no practitioner can fall without being subjected to disciplinary action.

§10.21 Canon 1.

A practitioner should assist in maintaining the integrity and competence of the legal profession.

§10.22 Maintaining integrity and competence of the legal profession.

(a) A practitioner is subject to discipline if the practitioner has made a materially false statement in, or if the practitioner has deliberately failed to disclose a material fact requested in connection with, the practitioner's application for registration or membership in the bar of any United States court or any State court or his or her authority to otherwise practice before the Office in trademark and other non-patent cases.

(b) A practitioner shall not further the application for registration or membership in the bar of any United States court, State court, or administrative agency of another person known by the practitioner to be unqualified in respect to character, education, or other relevant attribute.

§10.23 Misconduct.

(a) A practitioner shall not engage in disreputable or gross misconduct.

(b) A practitioner shall not:

(1) Violate a Disciplinary Rule.

(2) Circumvent a Disciplinary Rule through actions of another.

(3) Engage in illegal conduct involving moral turpitude.

(4) Engage in conduct involving dishonesty, fraud, deceit, or misrepresentation.

(5) Engage in conduct that is prejudicial to the administration of justice.

(6) Engage in any other conduct that adversely reflects on the practitioner's fitness to practice before the Office.

(c) Conduct which constitutes a violation of paragraphs (a) and (b) of this section includes, but is not limited to:

(1) Conviction of a criminal offense involving moral turpitude, dishonesty, or breach of trust.

(2) Knowingly giving false or misleading information or knowingly participating in a material way in giving false or misleading information, to:

(i) A client in connection with any immediate, prospective, or pending business before the Office.

(ii) The Office or any employee of the Office.

(3) Misappropriation of, or failure to properly or timely remit, funds received by a practitioner or the practitioner's firm from a client to pay a fee which the client is required by law to pay to the Office.

(4) Directly or indirectly improperly influencing, attempting to improperly influence, offering or agreeing to improperly influence, or attempting to offer or agree to improperly influence an official action of any employee of the Office by:

(i) use of threats, false accusations, duress, or coercion,

(ii) an offer of any special inducement or promise of advantage, or

(iii) bestowing of any gift, favor, or thing of value.

(5) Suspension or disbarment from practice as an attorney or agent by any duly constituted authority of a State or the United States or, in the case of a practitioner who resides in a foreign country or is registered under §10.6(c), suspension or disbarment as an attorney or agent by any duly constituted authority of:

(i) a State,

(ii) the United States, or

(iii) the country in which the practitioner resides.

(6) Knowingly aiding or abetting a practitioner, suspended or excluded from practice before the Office in engaging in unauthorized practice before the Office under §10.158.

(7) Knowingly withholding from the Office information identifying a patent or application of another from which one or more claims have been copied.

(8) Failing to forward, or failing to timely notify the Office of an inability to forward, to a client or former client correspondence received from the Office or the client's or former client's opponent in an *inter partes* proceeding before the Office when the correspondence (i) could have a significant effect on a matter pending before the Office, (ii) is received by the practitioner on behalf of a client or former client and (iii) is correspondence which a reasonable practitioner would believe under the circumstances should be forwarded to the client or former client.

(9) Knowingly misusing a certificate of mailing under §1.8 of this Subchapter or a certificate of "Express Mail" under §1.10 of this Subchapter.

(10) Violating the duty of candor or good faith requirements of §1.56(a) of this Subchapter.

(11) Knowingly filing, or causing to be filed, an application which is subject to being stricken under §1.56(c) of this Subchapter.

(12) In the absence of information sufficient to establish a reasonable belief in the existence of probable cause that a practitioner is in violation of, or has violated, a Disciplinary Rule, causing a disciplinary investigation to be made, or a disciplinary proceeding to be brought, against the practitioner by a court, a state, or an administrative agency.

(13) Knowingly preparing or prosecuting a patent application in violation of an undertaking signed under §10.6(e).

(14) Knowingly failing to advise the Director in writing of any change which would preclude continued registration under §10.6.

(15) Knowingly signing a paper filed in the Office in violation of the provisions of §10.18 or including scandalous or indecent matter in a paper filed in the Office.

(16) Willfully refusing to reveal or report knowledge or evidence to the Director contrary to §10.24 or paragraph (b) of §10.131.

(17) Representing before the Office in a patent case either a joint venture comprising an inventor and an invention developer or an inventor referred to the registered practitioner by an invention developer when (i) the registered practitioner knows, or has been advised by the Office, that a formal complaint filed by a federal or state agency, based on any violation of any law relating to securities, unfair methods of competition, unfair or deceptive acts or practices, mail fraud, or other civil or criminal conduct, is pending before a federal or state court or federal or state agency, or has been resolved unfavorably by such court or agency, against the invention developer in connection with invention development services and (ii) the registered practitioner fails to fully advise the inventor of the existence of the pending complaint or unfavorable resolution thereof prior to undertaking or continuing representation of the joint venture or inventor. "Invention developer" means any person, and any agent, employee, officer, partner, or independent contractor thereof, who is not a registered practitioner and who advertises invention development services in media of general circulation or who enters into contracts for invention development services with customers as a result of such advertisement. "Invention development services" means acts of invention development required or promised to be performed, or actually performed, or both, by an invention developer for a customer.

"Invention development" means the evaluation, perfection, marketing, brokering, or promotion of an invention on behalf of a customer by an invention developer, including a patent search, preparation of a patent application, or any other act done by an invention developer for consideration toward the end of procuring or attempting to procure a license, buyer, or patent for an invention. "Customer" means any individual who has made an invention and who enters into a contract for invention development services with an invention developer with respect to the invention by which the inventor becomes obligated to pay the invention developer less than $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention). "Contract for invention development services" means a contract for invention development services with an invention developer with respect to an invention made by a customer by which the inventor becomes obligated to pay the invention developer less that $5,000 (not to include any additional sums which the invention developer is to receive as a result of successful development of the invention).

(18) In the absence of information sufficient to establish a reasonable belief that fraud or inequitable conduct has occurred, alleging before a tribunal that anyone has committed a fraud on the Office or engaged in inequitable conduct in a proceeding before the Office.

(d) A practitioner who acts with reckless indifference to whether a representation is true or false is chargeable with knowledge of its falsity. Deceitful statements of half-truths or concealment of material facts shall be deemed actual fraud within the meaning of this part.

§10.24 Disclosure of information to authorities.

(a) A practitioner possessing unprivileged knowledge of a violation of a Disciplinary Rule shall report such knowledge to the Director.

(b) A practitioner possessing unprivileged knowledge or evidence concerning another practitioner, employee of the Office, or a judge shall reveal fully such knowledge or evidence upon proper request of a tribunal or other authority empowered to investigate or act upon the conduct of practitioners, employees of the Office, or judges.

(OBM Approval pending)

§§10.25-10.29 [reserved].

§10.30 Canon 2.

A practitioner should assist the legal profession in fulfilling its duty to make legal counsel available.

§10.31 Communications concerning a practitioner's services.

(a) No practitioner shall with respect to any prospective business before the Office, by word, circular, letter, or advertising, with intent to defraud in any manner, deceive, mislead, or threaten any prospective applicant or other person having immediate or prospective business before the Office.

(b) A practitioner may not use the name of a Member of either House of Congress or of an individual in the service of the United States in advertising the practitioner's practice before the Office.

(c) Unless authorized under §10.14(b), a non-lawyer practitioner shall not hold himself or herself out as authorized to practice before the Office in trademark cases.

(d) Unless a practitioner is an attorney, the practitioner shall not hold himself or herself out:

(i) to be an attorney or lawyer or

(ii) as authorized to practice before the Office in nonpatent and trademark cases.

§10.32 Advertising.

(a) Subject to §10.31, a practitioner may advertise services through public media, including a telephone directory, legal directory, newspaper, or other periodical, radio, or television, or through written communications not involving solicitation as defined by §10.33.

(b) A practitioner shall not give anything of value to a person for recommending the practitioner's services, except that a practitioner may pay the reasonable cost of advertising or written communication permitted by this section and may pay the usual charges of a not-for-profit lawyer referral service or other legal service organization.

(c) Any communication made pursuant to this section shall include the name of at least one practitioner responsible for its content.

§10.33 Direct contact with prospective clients.

A practitioner may not solicit professional employment from a prospective client with whom the practitioner has no family or prior professional relationship, by mail, in-person or otherwise, when a significant motive for the practitioner's doing so is the practitioner's pecuniary gain under circumstances evidencing undue influence, intimidation, or overreaching. The term "solicit" includes contact in person, by telephone or telegraph, by letter or other writing, or by other communication directed to a specific recipient, but does not include letters addressed or advertising circulars distributed generally to persons not specifically known to need legal services of the kind provided by the practitioner in a particular matter, but who are so situated that they might in general find such services useful.

§10.34 Communication of fields of practice.

A registered practitioner may state or imply that the practitioner is a specialist as follows:

(a) A registered practitioner who is an attorney may use the designation "Patents," "Patent Attorney," "Patent Lawyer," "Registered Patent Attorney," or a substantially similar designation.

(b) A registered practitioner who is not an attorney may use the designation "Patents," "Patent Agent," "Registered Patent Agent," or a substantially similar designation, except that any practitioner who was registered prior to Nov. 15, 1938, may refer to himself or herself as a "patent attorney."

§10.35 Firm names and letterheads.

(a) A practitioner shall not use a firm name, letter-

head, or other professional designation that violates §10.31. A trade name may be used by a practitioner in private practice if it does not imply a current connection with a government agency or with a public or charitable legal services organization and is not otherwise in violation of §10.31.

(b) Practitioners may state or imply that they practice in a partnership or other organization only when that is the fact.

§10.36 Fees for legal services.

(a) A practitioner shall not enter into an agreement for, charge, or collect an illegal or clearly excessive fee.

(b) A fee is clearly excessive when, after a review of the facts, a practitioner of ordinary prudence would be left with a definite and firm conviction that the fee is in excess of a reasonable fee. Factors to be considered as guides in determining the reasonableness of a fee include the following:

(1) The time and labor required, the novelty and difficulty of the questions involved, and the skill requisite to perform the legal service properly.

(2) The likelihood, if apparent to the client, that the acceptance of the particular employment will preclude other employment by the practitioner.

(3) The fee customarily charged in the locality for similar legal services.

(4) The amount involved and the results obtained.

(5) The time limitations imposed by the client or by the circumstances.

(6) The nature and length of the professional relationship with the client.

(7) The experience, reputation, and ability of the practitioner or practitioners performing the services.

(8) Whether the fee is fixed or contingent.

§10.37 Division of fees among practitioners.

(a) A practitioner shall not divide a fee for legal services with another practitioner who is not a partner in or associate of the practitioner's law firm or law office, unless:

(1) The client consents to employment of the other practitioner after a full disclosure that a division of fees will be made.

(2) The division is made in proportion to the services performed and responsibility assumed by each.

(3) The total fee of the practitioners does not clearly exceed reasonable compensation for all legal services rendered to the client.

(b) This section does not prohibit payment to a former partner or associate pursuant to a separation or retirement agreement.

§10.38 Agreements restricting the practice of a practitioner.

(a) A practitioner shall not be a party to or participate in a partnership or employment agreement with another practitioner that restricts the right of a practitioner to practice before the Office after the termination of a relationship created by the agreement, except as a condition to payment of retirement benefits.

(b) In connection with the settlement of a controversy or suit, a practitioner shall not enter into an agreement that restricts the practitioner's right to practice before the Office.

§10.39 Acceptance of employment.

A practitioner shall not accept employment on behalf of a person if the practitioner knows or it is obvious that such person wishes to:

(a) Bring a legal action or commence a proceeding before the Office, or conduct a defense, or assert a position in litigation or any proceeding pending before the Office, or otherwise have steps taken for the person, merely for the purpose or harassing or maliciously injuring any other person.

(b) Present a claim or defense in litigation or any proceeding before the Office that is not warranted under existing law, unless it can be supported by good faith argument for an extension, modification, or reversal of existing law.

§10.40 Withdrawal from employment.

(a) A practitioner shall not withdraw from employment in a proceeding before the Office without permission from the Office (see §§1.36, and 2.19 of this Subchapter). In any event, a practitioner shall not withdraw from employment until the practitioner has taken reasonable steps to avoid foreseeable prejudice to the rights of the client, including giving due notice to his or her client, allowing time for employment of another practitioner, delivering to the client all papers and property to which the client is entitled, and complying with applicable laws and rules. A practitioner who withdraws from employment shall refund promptly any part of a fee paid in advance that has not been earned.

(b) *Mandatory withdrawal.* A practitioner representing a client before the Office shall withdraw from employment if:

(1) the practitioner knows or it is obvious that the client is bringing a legal action, commencing a proceeding before the Office, conducting a defense, or asserting a position in litigation or any proceeding pending before the Office, or is otherwise having steps taken for the client, merely for the purpose of harassing or maliciously injuring any person;

(2) the practitioner knows or it is obvious that the practitioner's continued employment will result in violation of a Disciplinary Rule;

(3) the practitioner's mental or physical condition renders it unreasonably difficult for the practitioner to carry out the employment effectively; or

(4) the practitioner is discharged by the client.

(c) *Permissive withdrawal.* If paragraph (b) of this section is not applicable, a practitioner may not request permission to withdraw in matters pending before the Office, and may not withdraw in other matters, unless such request or such withdrawal is because:

(1) the petitioner's client:

(i) insists upon presenting a claim or defense that is not warranted under existing law and cannot be supported by good faith argument for an extension, modification, or reversal of existing law;

(ii) personally seeks to pursue an illegal course of conduct;

(iii) insists that the practitioner pursue a course of conduct that is illegal or that is prohibited under a Disciplinary Rule.

(iv) by other conduct renders it unreasonably difficult for the practitioner to carry out the employment effectively;

(v) insists, in a matter not pending before a tribunal, that the practitioner engage in conduct that is contrary to the judgement and advice of the practitioner but not prohibited under the Disciplinary Rule; or

(vi) has failed to pay one or more bills rendered by the practitioner for an unreasonable period of time or has failed to honor an agreement to pay a retainer in advance of the performance of legal services.

(2) the practitioner's continued employment is likely to result in a violation of a Disciplinary Rule;

(3) the practitioner's inability to work with co-counsel indicates that the best interests of the client likely will be served by withdrawal;

(4) the practitioner's mental or physical condition renders it difficult for the practitioner to carry out the employment effectively;

(5) the practitioner's client knowingly and freely assents to termination of the employment; or

(6) the practitioner believes in good faith, in a proceeding pending before the Office, that the Office will find the existence of other good cause for withdrawal.

§§10.41-10.45 [reserved].

§10.46 Canon 3.

A practitioner should assist in preventing the unauthorized practice of law.

§10.47 Aiding unauthorized practice of law.

(a) A practitioner shall not aid a non-practitioner in the unauthorized practice of law before the Office.

(b) A practitioner shall not aid a suspended or excluded practitioner in the practice of law before the Office.

(c) A practitioner shall not aid a non-lawyer in the unauthorized practice of law.

§10.48 Sharing legal fees.

A practitioner or a firm or practitioners shall not share legal fees with a non-practitioner except that:

(a) An agreement by a practitioner with the practitioner's firm, partner, or associate may provide for the payment of money, over a reasonable period of time after the practitioner's death, to the practitioner's estate or to one or more specified persons.

(b) A practitioner who undertakes to complete unfinished legal business of a deceased practitioner may pay to the estate of the decease practitioner that proportion of the total compensation which fairly represents the services rendered by the deceased practitioner.

(c) A practitioner or firm of practitioner's may include non-practitioner employees in a compensation or retirement plan, even though the plan is based in whole or in part on a profit-sharing arrangement, providing such plan does not circumvent another Disciplinary Rule.

§10.49 Forming a partnership with a non-practitioner.

A practitioner shall not form a partnership with a non-practitioner if any of the activities of the partnership consist of the practice of patent, trademark, or other law before the Office.

§§10.50-10.55 [reserved].

§10.56 Canon 4.

A practitioner should preserve the confidences and secrets of a client.

§10.57 Preservation of confidences and secrets of a client.

(a) "Confidence" refers to information protected by the attorney-client or agent-client privilege under applicable law. "Secret" refers to other information gained in the professional relationship that the client has requested be held inviolate or the disclosure of which would be embarrassing or would be likely to be detrimental to the client.

(b) Except when permitted under paragraph (c) of this section, a practitioner shall not knowingly:

(1) Reveal a confidence or secret of a client.

(2) Use a confidence or secret of a client to the disadvantage of the client.

(3) Use a confidence or secret of a client for the advantage of the practitioner or of a third person, unless the client consents after full disclosure.

(c) A practitioner may reveal:

(1) Confidences or secrets with the consent of the client affected but only after a full disclosure to the client.

(2) Confidences or secrets when permitted under Disciplinary Rules or required by law or court order.

(3) The intention of a client to commit a crime and the information necessary to prevent the crime.

(4) Confidences or secrets necessary to establish or collect the practitioner's fee or to defend the practitioner or the practitioner's employees or associates against an accusation of wrongful conduct.

(d) A practitioner shall exercise reasonable care to prevent the practitioner's employees, associates, and others whose services are utilized by the practitioner from disclosing or using confidences or secrets of a client, except that a practitioner may reveal the information allowed by paragraph (c) of this section through an employee.

§§10.58-10.60 [reserved].

§10.61 Canon 5.

A practitioner should exercise indepedent professional judgment on behalf of a client.

§10.62 Refusing employment when the interest of the practitioner may impair the practitioner's independent professional judgment.

(a) Except with the consent of a client after full disclosure, a practitioner shall not accept employment if the exercise of the practitioner's professional judgment on behalf of the client will be or reasonably may be affected by the practitioner's own financial, business, property, or personal interests.

(b) A practitioner shall not accept employment in contemplated or pending litigation or a proceeding in the Office if the practitioner knows or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness, except that the practitioner may undertake the employment and the pracitioner or another practitioner in the practitioner's firm may testify:

(1) If the testimony will relate solely to an uncontested matter.

(2) If the testimony will relate solely to a matter of formality and there is no reason to believe that substantial evidence will be offered in opposition to the testimony.

(3) If the testimony will relate solely to the nature and value of legal services rendered in the case by the practitioner or the practitioner's firm to the client.

(4) As to any matter, if refusal would work a substantial hardship on the client because of the distinctive value of the practitioner or the practitioner's firm as counsel in the particular case.

§10.63 Withdrawal when the practitioner becomes a witness.

(a) If, after undertaking employment in contemplated or pending litigation or a proceeding in the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm ought to sign an affidavit to be filed in the Office or be called as a witness on behalf of a practitioner's client, the practitioner shall withdraw from the conduct of the trial or proceeding and the practitioner's firm, if any, shall not continue representation in the trial or proceeding, except that the practitioner may continue the representation and the practitioner or another practitioner in the practitioner's firm may testify in the circumstances enumerated in paragraphs (1) through (4) of §10.62(b).

(b) If, after undertaking employment in contemplated or pending litigation or a proceeding in the Office, a practitioner learns or it is obvious that the practitioner or another practitioner in the practitioner's firm may be asked to sign an affidavit to be filed in the Office or be called as a witness other than on behalf of the practitioner's client, the practitioner may continue the representation until it is apparent that the practitioner's affidavit or testimony is or may be prejudicial to the practitioner's client.

§10.64 Avoiding acquisition of interest in litigation or proceeding before the Office.

(a) A practitioner shall not acquire a proprietary interest in the subject matter of a proceeding before the Office which the practitioner is conducting for a client, except that the practitioner may:

(1) Acquire a lien granted by law to secure the practitioner's fee or expenses; or

(2) Contract with a client for a reasonable contingent fee; or

(3) In a patent case, take an interest in the patent as part or all of his or her fee.

(b) While representing a client in connection with a contemplated or pending proceeding before the Office, a practitioner shall not advance or guarantee financial assistance to a client, except that a practitioner may advance or guarantee the expenses of going forward in a proceeding before the Office including fees required by law to be paid to the Office, expenses of investigation, expenses of medical examination, and costs of obtaining and presenting evidence, provided the client remains ultimately liable for such expenses.

§10.65 Limiting business relations with a client.

A practitioner shall not enter into a business transaction with a client if they have differing interests therein and if the client expects the practitioner to exercise professional judgment therein for the protection of the cli-

ent, unless the client has consented after full disclosure.

§10.66 Refusing to accept or continue employment if the interests of another client may impair the independent professional judgment of the practitioner.

(a) A practitioner shall decline proffered employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the acceptance of the proffered employment, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.

(b) A practitioner shall not continue multiple employment if the exercise of the practitioner's independent professional judgment in behalf of a client will be or is likely to be adversely affected by the practitioner's representation of another client, or if it would be likely to involve the practitioner in representing differing interests, except to the extent permitted under paragraph (c) of this section.

(c) In the situations covered by paragraphs (a) and (b) of this section a practitioner may represent multiple clients if it is obvious that the practitioner can adequately represent the interest of each and if each consents to the representation after full disclosure of the possible effect of such representation on the exercise of the practitioner's independent professional judgment on behalf of each.

(d) If a practitioner is required to decline employment or to withdraw from employment under a Disciplinary Rule, no partner, or associate, or any other practitioner affiliated with the practitioner or the practitioner's firm, may accept or continue such employement unless otherwise ordered by the Director or Commissioner.

§10.67 Settling similar claims of clients.

A practitioner who represents two or more clients shall not make or participate in the making of an aggregate settlement of the claims of or against the practitioner's clients, unless each client has consented to the settlement after being advised of the existence and nature of all the claims involved in the proposed settlement, of the total amount of the settlement, and of the participation of each person in the settlement.

§10.68 Avoiding influence by others than the client.

(a) Except with the consent of the practitioner's client after full disclosure, a practitioner shall not:

(1) Accept compensation from one other than the practitioner's client for the practitioner's legal services to or for the client.

(2) Accept from one other than the practitioner's client any thing of value related to the practitioner's representation of or the practitioner's employment by the client.

(b) A practitioner shall not permit a person who recommends, employs, or pays the practitioner to render legal services for another to direct or regulate the practitioner's professional judgment in rendering such legal services.

(c) A practitioner shall not practice with or in the form of a professional corporation or association authorized to practice law for a profit, if a non-practitioner has the right to direct or control the professional judgment of a practitioner.

§§10.69-10.75 [reserved]

§10.76 Canon 6.

A practitioner should represent a client competently

§10.77 Failing to act competently.

A practitioner shall not:

(a) Handle a legal matter which the practitioner knows or should know that the practitioner is not competent to handle, without associating with the practitioner another practitioner who is competent to handle it.

(b) Handle a legal matter without preparation adequate in the circumstances.

(c) Neglect a legal matter entrusted to the practitioner.

§10.78 Limiting liability to client.

A practitioner shall not attempt to exonerate himself or herself from, or limit his or her liability to, a client for his or her personal malpractice.

§§10.79-10.82 [reserved].

§10.83 Canon 7.

A practitioner should represent a client zealously within the bounds of the law.

§10.84 Representing a client zealously.

(a) A practitioner shall not intentionally:

(1) Fail to seek the lawful objectives of a client through reasonably available means permitted by law and the Disciplinary Rules, except as provided by paragraph (b) of this section. A practitioner does not violate the provisions of this section, however, by acceding to reasonable requests of opposing counsel which do not prejudice the rights of the client, by being punctual in fulfilling all professional commitments, by avoiding offensive tactics, or by treating with courtesy and consideration all persons involved in the legal process.

(2) Fail to carry out a contract of employment entered into with a client for professional services, but a practitioner may withdraw as permitted under §§10.40, 10.63, and 10.66.

(3) Prejudice or damage a client during the course of a professional relationship, except as required under §10.85.

(b) In representation of a client, a practitioner may:

(1) Where permissible, exercise professional judgment to waive or fail to assert a right or position of the client.

(2) Refuse to aid or participate in conduct that the practitioner believes to be unlawful, even through there is some support for an argument that the conduct is legal.

§10.85 Representing a client within the bounds of the law.

(a) In representation of a client, a practitioner shall not:

(1) Initiate or defend any proceeding in the Office, assert a position, conduct a defense, delay a trial or proceeding in the Office, or take other action on behalf of the practitioner's client when the practitioner knows or when it is obvious that such action would serve merely to harass or maliciously injure another.

(2) Knowingly advance a claim or defense that is unwarranted under existing law, except that a practitioner may advance such claim or defense if it can be supported by good faith argument for an extension, modification, or reversal of existing law.

(3) Conceal or knowingly fail to disclose that which the practitioner is required by law to reveal.

(4) Knowingly use perjured testimony or false evidence.

(5) Knowingly make a false statement or law or fact.

(6) Participate in the creation or preservation of evidence when the practitioner knows or it is obvious that the evidence is false.

(7) Counsel or assist a client in conduct that the practitioner knows to be illegal or fraudulent.

(8) Knowingly engage in other illegal conduct or conduct contrary to a Disciplinary Rule.

(b) A practitioner who receives information clearly establishing that:

(1) A client has, in the course of the representation, perpetrated a fraud upon a person or tribunal shall promptly call upon the client to rectify the same, and if the client refuses or is unable to do so the practitioner shall reveal the fraud to the affected person or tribunal.

(2) A person other than a client has perpetrated a fraud upon a tribunal shall promptly reveal the fraud to the tribunal.

§10.87 Communicating with one of adverse interest.

During the course of representation of a client, a practitioner shall not:

(a) Communicate or cause another to communicate on the subject of the representation with a party the practitioner knows to be represented by another practitioner

in that matter unless the practitioner has the prior consent of the other practitioner representing such other party or is authorized by law to do so.

(b) Give advice to a person who is not represented by a practitioner other than the advice to secure counsel, if the interests of such person are or have a reasonable possibility of being in conflict with the interests of the practitioner's client.

§10.88 Threatening criminal prosecution.

A practitioner shall not present, participate in presenting, or threaten to present criminal charges solely to obtain an advantage in any prospective or pending proceeding before the Office.

§10.89 Conduct in proceedings.

(a) A practitioner shall not disregard or advise a client to disregard any provision of this Subchapter or a decision of the Office made in the course of a proceeding before the Office, but the practitioner may take appropriate steps in good faith to test the validity of such provision or decision.

(b) In presenting a matter to the Office, a practitioner shall disclose:

(1) Controlling legal authority known to the practitioner to be directly adverse to the position of the client and which is not disclosed by opposing counsel or an employee of the Office.

(2) Unless privileged or irrelevant, the identities of the client the practitioner represents and of the persons who employed the practitioner.

(c) In appearing in a professional capacity before a tribunal, a practitioner shall not:

(1) State or allude to any matter that the practitioner has no reasonable basis to believe is relevant to the case or that will not be supported by admissible evidence.

(2) Ask any question that the practitioner has no reasonable basis to believe is relevant to the case and that is intended to degrade a witness or other person.

(3) Assert the practitioner's personal knowledge of the facts in issue, except when testifying as a witness.

(4) Assert the practitioner's personal opinion as to the justness of a cause, as to the credibility of a witness, as to the culpability of a civil litigant, or as to guilt or innocence of an accused; but the practitioner may argue, on the practitioner's analysis of the evidence, for any position or conclusion with respect to the matters stated herein.

(5) Fail to comply with known customs of courtesy or practice of the Office without giving to opposing counsel timely notice of the practitioner's intent not to comply.

(6) Engage in undignified or discourteous conduct which is degrading to a tribunal.

(7) Intentionally or habitually violate any provision of this Subchapter or established rule of evidence.

§10.90-10.91 [reserved].

§10.92 Contact with witnesses.

(a) A practitioner shall not suppress any evidence that the practitioner or the practitioner's client has a legal obligation to reveal or produce.

(b) A practitioner shall not advise or cause a person to be secreted or to leave the jurisdiction of a tribunal for the purpose of making the person unavailable as a witness therein.

(c) A practitioner shall not pay, offer to pay, or acquiesce in the payment of compensation to a witness contingent upon the content of the witness' affidavit, testimony or the outcome of the case. But a practitioner may advance, guarantee, or acquiesce in the payment of:

(1) Expenses reasonably incurred by a witness in attending, testifying, or making an affidavit.

(2) Reasonable compensation to a witness for the witness' loss of time in attending, testifying, or making an affidavit.

(3) A reasonable fee for the professional services of an expert witness.

§10.93 Contact with officials.

(a) A practitioner shall not give or lend anything of value to a judge, official, or employee of a tribunal under circumstance which might give the appearance that the gift or loan is made to influence official action.

(b) In an adversary proceeding, including any *inter partes* proceeding in the Office, a practitioner shall not communicate, or cause another to communicate, as to the merits of the cause with a judge, official, or Office employee before whom the proceeding is pending, except:

(1) In the course of official proceedings in the cause.

(2) In writing if the practitioner promptly delivers a copy of the writing to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.

(3) Orally upon adequate notice to opposing counsel or to the adverse party if the adverse party is not represented by a practitioner.

(4) As otherwise authorized by law.

§§10.94-10.99 [reserved].

§10.100 Canon 8.

A practitioner should assist in improving the legal system.

§10.101 Action as a public official.

(a) A practitioner who holds public office shall not:

(1) Use the practitioner's public position to obtain, or attempt to obtain, a special advantage in legislative matters for the practitioner or for a client under circumstances where the practitioner knows or it is obvious that such action is not in the public interest.

(2) Use the practitioner's public position to influence, or attempt to influence, a tribunal to act in favor of the practitioner or of a client.

(3) Accept any thing of value from any person when the practitioner knows or it is obvious that the offer is for the purpose of influencing the practitioner's action as a public official.

(b) A practitioner who is an officer or employee of the United States shall not practice before the Office in patent cases except as provided in §10.6(d).

§10.102 Statements concerning officials.

(a) A practitioner shall not knowingly make false statements of fact concerning the qualifications of a candidate for election or appointment to a judicial office or to a position in the Office.

(b) A practitioner shall not knowingly make false accusations against a judge, other adjudicatory officer, or employee of the Office.

§10.103 Practitioner candidate for judicial office.

A practitioner who is a candidate for judicial office shall comply with applicable provisions of law.

§10.104-10.109 [reserved].

§10.110 Canon 9.

A practitioner should avoid even the appearance of professional impropriety.

§10.111 Avoiding even the appearance of impropriety.

(a) A practitioner shall not accept private employment in a matter upon the merits of which he or she has acted in a judicial capacity.

(b) A practitioner shall not accept private employment in a matter in which he or she had personal responsibility while a public employee.

(c) A practitioner shall not state or imply that the practitioner is able to influence improperly or upon irrelevant grounds any tribunal, legislative body, or public official.

§10.112 Preserving identity of funds and property of client.

(a) All funds of clients paid to a practitioner or a practitioner's firm, other than advances for costs and expenses, shall be deposited in one or more identifiable bank accounts maintained:

(1) in the case of a practitioner whose office is located in the United States, in the State in which the practitioner's office is situated or

(2) in the case of a practitioner having an office in a

foreign country or registered under §10.6(c) in the United States or the foreign country.

(b) No funds belonging to the practitioner or the practitioner's firm shall be deposited in the bank accounts required by paragraph (a) of this section except as follows:

(1) Funds reasonably sufficient to pay bank charges may be deposited therein.

(2) Funds belonging in part to a client and in part presently or potentially to the practitioner or the practitioner's firm must be deposited therein, but the portion belonging to the practitioner or the practitioner's firm may be withdrawn when due unless the right of the practitioner or the practitioner's firm to receive it is disputed by the client, in which event the disputed portion shall not be withdrawn until the dispute is finally resolved.

(c) A practitioner shall:

(1) Promptly notify a client of the receipt of the client's funds, securities, or other properties.

(2) Identify and label securities and properties of a client promptly upon receipt and place them in a safe deposit box or other place of safekeeping as soon as practicable.

(3) Maintain complete records of all funds, securities, and other properties of a client coming into the possession of the practitioner and render appropriate accounts to the client regarding the funds, securities, or other properties.

(4) Promptly pay or deliver to the client as requested by a client the funds, securities, or other properties in the possession of the practitioner which the client is entitled to receive.

(OMB approval pending)

§§10.113-10.129 [reserved].

Disciplinary Proceedings

§10.130 Reprimand, suspension or exclusion.

(a) The Commissioner may, after notice and opportunity for a hearing, (a) reprimand or (b) suspend or exclude, either generally or in any particular case, any individual, attorney, or agent shown to be incompetent or disreputable, who is guilty of gross misconduct, or who violates a Disciplinary Rule.

(b) Petitions to disqualify a practitioner in *ex parte* or *inter partes* cases in the Office are not governed by §§10.130 through 10.170 and will be handled on a case-by-case basis under such conditions as the Commissioner deems appropriate.

§10.131 Investigations.

(a) The Director is authorized to investigate possible violations of Disciplinary Rules by practitioners. See §10.2(b)(2). The investigation shall be such as to determine whether there is probable cause to believe that a violation of a Disciplinary Rule by a practitioner has occurred.

(b) Practitioners shall report and reveal to the Director any knowledge or evidence required by §10.24. A practitioner shall cooperate with the Director is connection with any investigation under paragraph (a) of this section and with officials of the Office in connection with any disciplinary proceeding instituted under § 10.132(b).

(c) Any non-practitioner possessing knowledge or information concerning a violation of a Disciplinary Rule by a practitioner may report the violation to the Director. The Director may require that report be presented in the form of an affidavit.

§10.132 Initiating a disciplinary proceeding; reference to an administrative law judge.

(a) If after conducting an investigation under §10.131(a) the Director is of the opinion that there is probable cause to believe that a practitioner has violated a Disciplinary Rule, the Director shall, after complying where necessary with the provisions of 5 U.S.C. 558(c), call a meeting of the Committee on Discipline. The Committee on Discipline shall then determine as specified in §10.4(b) whether a disciplinary proceeding shall be instituted under paragraph (b) of this section.

(b) If the Committee on Discipline determines that probable cause exists to believe that a practitioner has violated a Disciplinary Rule, the Director shall institute a disciplinary proceeding by filing a complaint under §10.134. The complaint shall be filed in the Office of the Director. A disciplinary proceeding may result in:

(1) a reprimand or

(2) suspension or exclusion of a practitioner from practice before the Office.

(c) Upon the filing of a complaint under §10.134, the Commissioner will refer the disciplinary proceeding to an administrative law judge.

§10.133 Conference between Director and practitioner; resignation.

(a) *General.* The Director may confer with a practitioner concerning possible violations by the practitioner of a Disciplinary Rule whether or not a disciplinary proceeding has been instituted.

(b) *Resignation.* Any practitioner who is the subject of an investigation under §10.131 or against whom a complaint has been filed under §§10.132(b) and 10.134 may resign from practice before the Office by submitting his or her resignation by filing with the Director an affidavit stating his or her desire to resign. The affidavit shall state that:

(1) the resignation is freely and voluntarily proferred;

(2) the practitioner is not acting under duress or coersion from the Office;

(3) the practitioner is fully aware of the implications of filing the resignation;

(4) the practitioner is aware (i) of a pending investigation of (ii) or charges arising from the complaint alleging that he or she is guilty of a violation of the Patent and Trademark Office Code of Professional Responsibility, the nature of which shall be set forth by the practitioner to the satisfaction of the Director;

(5) the practitioner acknowledges the material facts on which the complaint is based are true; and

(6) the resignation is being submitted because the practitioner could not successfully defend himself or herself against (i) charges predicated on the violation under investigation or (ii) charges set out in the complaint filed against him or her.

(c) When an affidavit under paragraph (b) of this section is received while an investigation is pending, the Commissioner shall enter an order excluding the practitioner "on consent." When an affidavit under paragraph (b) of this section is received after a complaint has been filed, the Director shall notify the administrative law judge. The administrative law judge shall enter an order transferring the disciplinary proceeding to the Commissioner and the Commissioner shall enter an order excluding the practitioner "on consent."

(d) Any practitioner who resigns from practice before the Office under this section and who intends to reapply for admission to practice before the Office must comply with the provisions of §10.158.

(e) *Settlement.* Before or after a complaint is filed under §10.134, a settlement conference may occur between the Director and a practitioner for the purpose of settling any disciplinary matter. If an offer of settlement is made by the Director or the practitioner and is not accepted by the other, no reference to the offer of settlement or its refusal shall be admissible in evidence in the disciplinary proceeding unless both the Director and the practitioner agree in writing.

§10.134 Complaint.

(a) A complaint instituting a disciplinary proceeding shall:

(1) Name the practitioner, who may then be referred to as the "respondent."

(2) Give a plain and concise description of the alleged violations of the Disciplinary Rules by the practitioner.

(3) State the place and time for filing an answer by the respondent.

(4) State that a decision by default may be entered against the respondent if an answer is not timely filed.

(5) Be signed by the Director.

(b) A complaint will be deemed sufficient if it fairly informs the respondent of any violation of the Disciplinary Rules which form the basis for the disciplinary proceeding so that the respondent is able to adequately prepare a defense.

§10.135 Service of complaint.

(a) A complaint may be served on a respondent in any of the following methods:

(1) By handing a copy of the complaint personally to the respondent, in which case the individual handing the complaint to the respondent shall file an affidavit with the Director indicating the time and place the complaint was handed to the respondent.

(2) By mailing a copy of the complaint by "Express Mail" or first-class mail to:

(i) a registered practitioner at the address for which separate notice was last received by the Committee on Enrollment or

(ii) a non-registered practitioner at the last address for the respondent known to the Director.

(3) By any method mutually agreeable to the Director and the respondent.

(b) If a complaint served by mail under paragraph (a)(2) of this secton is returned by the U.S. Postal Service, the Director shall mail a second copy of the complaint to the respondent. If the second copy of the complaint is also returned by the U.S. Postal Service, the Director shall serve the respondent by publishing an appropriate notice in the *Official Gazette* for four consecutive weeks, in which case the time for answer shall be at least thirty days from the fourth publication of the notice.

(c) If a respondent is a registered practitioner, the Director may serve simultaneously with the complaint a letter under §10.11(b). The Director may require the respondent to answer the §10.11(b) letter within a period of not less than 15 days. An answer to the §10.11(b) letter shall constitute proof of service. If the respondent fails to answer the §10.11(b) letter, his or her name will be removed from the register as provided by §10.11(b).

(d) If the respondent is represented by an attorney under §10.140(a), a copy of the complaint shall also be served on the attorney.

§10.136 Answer to complaint.

(a) *Time for answer.* An answer to a complaint shall be filed within a time set in the complaint which shall be not less than thirty days.

(b) *With whom filed.* The answer shall be filed in writing with the administrative law judge. The time for filing an answer may be extended once for a period of no more than thirty days by the administrative law judge upon a showing of good cause provided a motion requesting an extension of time is filed within thirty days after the date the complaint is filed by the Director. A copy of the answer shall be served on the Director.

(c) *Content.* The respondent shall include in the answer a statement of the facts which constitute the grounds of defense and shall specifically admit or deny each allegation set forth in the complaint. The respondent shall not deny a material allegation in the complaint which the respondent knows to be true or state that respondent is without sufficient information to form a belief as to the truth of an allegation when in fact the respondent possesses that information. The respondent shall also state affirmatively special matters of defense.

(d) *Failure to deny allegations in complaint.* Every allegation in the complaint which is not denied by a respondent in the answer is deemed to be admitted and may be considered proven. No further evidence in respect of that allegation need be received by the administrative law judge at any hearing. Failure to timely file an answer will constitute an admission of the allegations in the complaint.

(e) *Reply by Director.* No reply to an answer is required by the Director and any affirmative defense in the answer shall be deemed to be denied. The Director may, however, file a reply if he or she chooses or if ordered by the administrative law judge.

§10.137 Supplemental complaint.

False statements in an answer may be made the basis of a supplemental complaint.

§10.138 Contested case.

Upon the filing of an answer by the respondent, a disciplinary proceeding shall be regarded as a contested case within the meaning of 35 U.S.C. 24. Evidence obtained by a subpoena issued under 35 U.S.C. 24 shall not be admitted into the record or considered unless leave to proceed under 35 U.S.C. 24 was previously authorized by the administrative law judge.

§10.139 Administrative law judge; appointment; responsibilities; review of interlocutory orders; stays.

(a) *Appointment.* An administrative law judge, appointed under 5 U.S.C. 3105, shall conduct disciplinary proceedings as provided by this part.

(b) *Responsibilities.* The administrative law judge shall have authority to:

(1) Administer oaths and affirmations;

(2) Make rulings upon motions and other requests;

(3) Rule upon offers of proof, receive relevant evidence, and examine witnesses;

(4) Authorize the taking of a deposition of a witness in lieu of personal appearance of the witness before the administrative law judge;

(5) Determine the time and place of any hearing and regulate its course and conduct;

(6) Hold or provide for the holding of conferences to settle or simplify the issues;

(7) Receive and consider oral or written arguments on facts or law;

(8) Adopt procedures and modify procedures from time to time as occasion requires for the orderly disposition of proceedings;

(9) Make initial decisions under §10.154; and

(10) Perform acts and take measures as necessary to promote the efficient and timely conduct of any disciplinary proceeding.

(c) *Time for making initial decision.* The administrative law judge shall set times and exercise control over a disciplinary proceeding such that an initial decision under §10.154 is normally issued within six months of the date a complaint is filed. The administrative law judge may, however, issue an initial decision more than six months after a complaint is filed if in his or her opinion there exist unusual circumstances which preclude issuance of an initial decision within six months of the filing of the complaint.

(d) *Review of interlocutory orders.* An interlocutory order of an administrative law judge will not be reviewed by the Commissioner except:

(1) When the administrative law judge shall be of the opinion (i) that the interlocutory order involves a controlling question of procedure or law as to which there is a substantial ground for a difference of opinion and (ii) that an immediate decision by the Commissioner may materially advance the ultimate termination of the disciplinary proceeding or

(2) Is an extraordinary situation where justice requires review.

(e) *Stays pending review of interlocutory order.* If the Director or a respondent seek review of an interlocutory order of an administrative law judge under paragraph (b)(2) of this section, any time period set for taking action by the administrative law judge shall not be stayed unless ordered by the Commissioner or the administrative law judge.

§10.140 Representative for Director or respondent.

(a) A respondent may be represented before the Office in connection with an investigation or disciplinary proceeding by an attorney. The attorney shall file a written declaration that he or she is an attorney within the meaning of §10.1(c) and shall state:

(1) The address to which the attorney wants corre-

spondence related to the investigation or disciplinary proceeding sent and

(2) A telephone number where the attorney may be reached during normal business hours.

(b) The Commissioner shall designate at least two associate solicitors in the Office of the Solicitor to act as representative for the Director in disciplinay proceedings. In prosecuting disciplinary proceedings, the designated associate solicitors shall not involve the Solicitor or the Deputy Solicitor. The Solicitor and the Deputy Solicitor shall remain insulated from the investigation and prosecution of all disciplinary proceedings in order that they shall be available as counsel to the commissioner in deciding disciplinary proceedings.

§10.141 Filing of papers.

(a) The provisions of §1.8 of this Subchapter do not apply to disciplinary proceedings.

(b) All papers filed after the complaint and prior to entry of an initial decision by the administrative law judge shall be filed with the administrative law judge at an address or place designated by the administrative law judge. All papers filed after entry of an initial decision by the administrative law judge shall be filed with the Director. The Director shall promptly forward to the Commissioner any paper which requires action under this part by the Commissioner.

(c) The administrative law judge or the Director may provide for filing papers and other matter by hand or by "Express Mail."

§10.142 Service of papers.

(a) All papers other than a complaint shall be served on a respondent represented by an attorney by:

(1) Delivering a copy of the paper to the office of the attorney; or

(2) Mailing a copy of the paper by first-class mail or "Express Mail" to the attorney at the address provided by the attorney under §10.140 (a)(1); or

(3) Any other method mutually agreeable to the attorney and a representative for the Director.

(b) All papers other than a complaint shall be served on a respondent who is not represented by an attorney by:

(1) Delivering a copy of the paper to the respondent; or

(2) Mailing a copy of the paper by first-class mail or "Express Mail" to the respondent at the address to which a complaint may be served or such other address as may be designated in writing by the respondent; or

(3) Any other method mutually agreeable to the respondent and a representative of the Director.

(c) A respondent shall serve on the representative for the Director one copy of each paper filed with the administrative law judge or the Director. A paper may be served on the representative for the Director by:

(1) Delivering a copy of the paper to the representative; or

(2) Mailing a copy of the paper by first-class mail or "Express Mail" to an address designated in writing by the representative; or

(3) Any other method mutually agreeable to the respondent and the representative.

(d) Each paper filed in a disciplinary proceeding shall contain therein a certificate of service indicating:

(1) The date on which service was made and

(2) The method by which service was made.

(e) The administrative law judge or the Commissioner may require that a paper be served by hand or by "Express Mail."

(f) Service by mail is completed when the paper mailed in the United States is placed into the custody of the U.S. Postal Service.

§10.143 Motions.

Motions may be filed with the administrative law judge. The administrative law judge will determine on a case-by-case basis the time period for response to a motion and whether replies to responses will be authorized. No motion shall be filed with the administrative law judge unless such motion is supported by a written statement by the moving party that the moving party or attorney for the moving party has conferred with the opposing party or attorney for the opposing party in an effort in good faith to resolve by agreement the issues raised by the motion and has been unable to reach agreement. If issues raised by a motion are resolved by the parties prior to a decision on the motion by the administrative law judge, the parties shall promptly notify the administrative law judge.

§10.144 Hearings.

(a) The administrative law judge shall preside at hearings in disciplinary proceedings. Hearings will be stenographically recorded and transcribed and the testimony of witnesses will be received under oath or affirmation. The administrative law judge shall conduct hearings in accordance with 5 U.S.C. 556. A copy of the transcript of the hearing shall become part of the record. A copy of the transcript shall be provided to the Director and the respondent at the expense of the Office.

(b) If the respondent to a disciplinary proceeding fails to appear at the hearing after a notice of hearing has been given by the administrative law judge, the administrative law judge may deem the respondent to have waived the right to a hearing and may proceed with the hearing in the absence of the respondent.

(c) A hearing under this section will not be open to the public except that the Director may grant a request by a respondent to open his or her hearing to the public and make the record of the disciplinary proceeding available for public inspection, *provided* agreement is reached in advance to exclude from public disclosure information which is privileged or confidential under applicable laws or regulations. If a disciplinary proceeding results in disciplinary action against a practitioner, and subject to §10.159 (c), the record of the entire disciplinary proceeding, including any settlement agreement, will be available for public inspection.

§10.145 Proof; variance; amendment of pleadings.

In case of a variance between the evidence and the allegations in a complaint, answer, or reply, if any, the administrative law judge may order or authorize amendment of the complaint, answer, or reply to conform to the evidence. Any party who would otherwise be prejudiced by the amendment will be given reasonable opportunity to meet the allegations in the complaint, answer, or reply, as amended, and the administrative law judge shall make findings on any issure presented by the complaint, answer, or reply as amended.

§§10.146-10.148 [reserved].

§10.149 Burden of Proof.

In a disciplinary proceeding, the Director shall have the burden of proving his or her case by a preponderance of evidence and a respondent shall have the burden of proving any affirmative defense by a preponderance of evidence.

§10.150 Evidence.

(a) *Rules of evidence.* The rules of evidence prevailing in courts of law and equity are not controlling in hearings in disciplinary proceedings. However, the administrative law judge shall exclude evidence which is irrelevant, immaterial, or unduly repetitious.

(b) *Depositions.* Depositions of witnesses taken pursuant to §10.151 may be admitted as evidence.

(c) *Government documents.* Official documents, records, and papers of the Office are admissible without extrinsic evidence of authenticity. These documents, records and papers may be evidenced by a copy certified as correct by an employee of the Office.

(d) *Exhibits.* If any document, record, or other paper is introduced in evidence as an exhibit, the administrative law judge may authorize the withdrawal of the exhibit subject to any conditions the administrative law judge deems appropriate.

(e) *Objections.* Objections to evidence will be in short form, stating the grounds of objection. Objections and

rulings on objections will be a part of the record. No exception to the ruling is necessary to preserve the rights of the parties.

§10.151 Depositions.

(a) Depositions for use at the hearing in lieu of personal appearance of a witness before the administrative law judge may be taken by respondent or the Director upon a showing of good cause and with the approval of, and under such conditions as may be deemed appropriate by, the administrative law judge. Depositions may be taken upon oral or written questions, upon not less than ten days written notice to the other party, before any officer authorized to administer an oath or affirmation in the place where the deposition is to be taken. The requirement of ten days notice may be waived by the parties and depositions may then be taken of a witness and at a time and place mutually agreed to by the parties. When a deposition is taken upon written questions, copies of the written questions will be served upon the other party with the notice and copies of any written cross-questions will be served by hand or "Express Mail" within five days of the date of the taking of the deposition unless the parties mutually agree otherwise. A party on whose behalf a deposition is taken shall file a copy of a transcript of the deposition signed by a court reporter with the administrative law judge and shall serve one copy upon the opposing party. Expenses for a court reporter and preparing, serving, and filing depositions shall be borne by the party at whose instance the deposition is taken.

(b) When the Director and the respondent agree in writing, a deposition of any witness who will appear voluntarily may be taken under such terms and conditions as may be mutually agreeable to the Director and the respondent. The deposition shall not be filed with the administrative law judge and may not be admitted in evidence before the administrative law judge unless he or she orders the deposition admitted in evidence. The admissibility of the deposition shall lie within the discretion of the administrative law judge who may reject the deposition on any reasonable basis including the fact that demeanor is involved and that the witness should have been called to appear personally before the administrative law judge.

§10.152 Discovery.

Discovery shall not be authorized except as follows:

(a) The administrative law judge may require parties to file and serve, prior to any hearing, a pre-hearing statement which contains:

(1) A list (together with a copy) of all proposed exhibits to be used in connection with a party's case-in-chief,

(2) A list of proposed witnesses,

(3) The identity of government employees who have investigated the case, and

(4) Copies of memoranda reflecting respondent's own statements to administrative representatives:

(b) After a witness testifies for a party, if the opposing party requests, the party may be required to produce, prior to cross-examination, any written statement made by the witness.

§10.153 Proposed findings and conclusions; post hearing memorandum.

Except in cases when the respondent has failed to answer the complaint, the administrative law judge, prior to making an initial decision, shall afford the parties a reasonable opportunity to submit proposed findings and conclusions and a post-hearing memorandum in support of the proposed findings and conclusions.

§10.154 Initial decision of administrative law judge.

(a) The administrative law judge shall make an initial decision in the case. The decision will include (a) a statement of findings and conclusions, as well as the reasons or basis therefor with appropriate references to the record, upon all the material issues of fact, law, or discretion presented on the record, and (b) an order of suspension or exclusion from practice, an order of reprimand, or an order dismissing the complaint. The administrative law judge shall file the decision with the Director and shall transmit a copy to the representative of the Director and to the respondent. In the absence of an appeal to the Commissioner, the decision of the administrative law judge will, without further proceedings, become the decision of the Commissioner of Patents and Trademarks thirty (30) days from the date of the decision of the administrative law judge.

(b) The initial decision of the administrative law judge shall explain the reason for any penalty of reprimand, suspension or exclusion. In determining any penalty, the following should normally be considered:

(1) The public interest;

(2) The seriousness of the violation of the Disciplinary Rule;

(3) The deterrent effects deemed necessary; and

(4) The integrity of the legal profession.

§10.155 Appeal to the Commissioner.

(a) Within thirty (30) days from the date of the initial decision of the administrative law judge under §10.154, either party may appeal to the Commissioner. An appeal by the respondent will be filed with the Director in duplicate and will include exceptions to the decisions of the administrative law judge and supporting reasons for those exceptions. If the Director files the appeal, the Director shall serve a copy of the appeal on the respondent. Within thirty (30) days after receipt of an appeal or copy thereof, the other party may file a reply brief in duplicate with the Director. If the Director files the reply brief, the Director shall serve a copy of the reply brief on the respondent. Upon the filing of an appeal and a reply brief, if any, the Director shall transmit the entire record to the Commissioner.

(b) The appeal will be decided by the Commissioner on the record made before the administrative law judge.

(c) The Commissioner may order reopening of the disciplinary proceeding in accordance with the principles which govern the granting of new trials. Any request to reopen a disciplinary proceeding on the basis of newly discovered evidence must demonstrate that the newly discovered evidence could not have been discovered by due diligence.

§10.156 Decision of the Commissioner.

(a) An appeal from an initial decision of the administrative law judge shall be decided by the Commissioner. The Commissioner may affirm, reverse, or modify the initial decision or remand the matter to the administrative law judge for such further proceedings as the Commissioner may deem appropriate. Entry of a decision by the Commissioner is a final agency action in a disciplinary proceeding. In making a final decision, the Commissioner shall review the record or those portions of the record as may be cited by the parties in order to limit the issues. The Commissioner shall transmit a copy of the final decision to the Director and to the respondent.

(b) A final decision of the Commissioner may dismiss a disciplinary proceeding, reprimand a practitioner, or may suspend or exclude the practitioner from practice before the Office.

§10.157 Review of Commissioner's final decision.

(a) Review of the Commissioner's final decision in a disciplinary case may be had by a petition filed in the United States District Court for the District of Columbia. See 35 U.S.C. 32 and Local Rule 1-26 of the United States District Court for the District of Columbia.

(b) The Commissioner may stay a final decision pending a review of the Commissioner's final decision.

§10.158 Suspended or excluded practitioner.

(a) A practitioner who is suspended or excluded from practice before the Office under §10.156(b) shall not engage in unauthorized practice of patent, trademark and other non-patent law before the Office.

(b) Unless otherwise ordered by the Commissioner, any practitioner who is suspended or excluded from practice before the Office under §10.156(b) shall:

(1) Within 30 days of entry of the order of suspension or exclusion, notify all bars of which he or she is a member and all clients of the practitioner in separate written communications of the suspension or exclusion and shall file a copy of each written communication with the Director.

(2) Within 30 days of entry of the order of suspension or exclusion, surrender a client's active case files to (i) the client or (ii) another practitioner designated by the client.

(3) Not hold himself or herself out as authorized to practice law before the Office.

(4) Promptly take any necessary and appropriate steps to remove from any telephone, legal, or other directory any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice patent, trademark or other non-patent law before the Office, and within 30 days of taking those steps, file with the Director an affidavit describing the precise nature of the steps taken.

(5) Not advertise the practitioner's availability or ability to perform or render legal services for any person having immediate, prospective, or pending business before the Office.

(6) Not render legal advice or services to any person having immediate, prospective, or pending business before the Office as to that business.

(7) Promptly take steps to change any sign identifying a practitioner's or the practitioner's firm's office and the practitioner's or the practitioner's firm's stationary to delete therefrom any advertisement, statement, or representation which would reasonably suggest that the practitioner is authorized to practice law before the Office.

(8) Within 30 days, return to any client any unearned funds, including any unearned retainer fee, and any securities and property of the client.

(c) A practitioner who is suspended or excluded from practice before the Office and who aides another practitioner in any way in the other practitioner's practice of law before the Office, may, under the direct supervision of the other practitioner, act as a para-legal for the other practitioner or perform other services for the other practitioner which are normally performed by lay-persons, *provided*: (1) the practitioner who is suspended or excluded is (i) a salaried employee of the other practitioner or the other practitioner's law firm and (ii) does not share profits with the other practitioner or the other practitioner's law firm; (2) the other practitioner assumes full professional responsibility to any client and the Office for any work performed by the suspended or excluded practitioner for the other practitioner; (3) the suspended or excluded practitioner, in connection with any immediate, prospective, or pending business before the Office, does not (i) communicate directly in writing, orally, or otherwise with a client of the other practitioner, (ii) render any legal advice, or any legal services, to a client of the other practitioner, or (iii) meet in person or in the presence of the other practitioner, with any client of the other practitioner or the other practitioner' s law firm or any witness or potential witness which the other practitioner or the other practitioner's law firm may or intends to call as a witness in any proceeding before the Office. The term "witness" includes individuals who will testify orally in a proceeding before, or sign an affidavit or any other document to be filed in, the Office.

(d) When a suspended or excluded practitioner acts as a para-legal or performs services under paragraph (c) of this section, the suspended or excluded practitioner shall not thereafter be reinstated to practice before the Office unless:

(1) The suspended or excluded practitioner shall have filed with the Director an affidavit which (i) explains in detail the precise nature of all para-legal or other services performed by the suspended or excluded practitioner and (ii) shows by clear and convincing evidence that the suspended or excluded practitioner has complied with the provisions of this section and all Disciplinary Rules, and

(2) The other practitioner shall have filed with the Director a written statement which (i) shows that the other practitioner has read the affidavit required by subparagraph (d)(1) of this section and that the other practitioner believes every statement in the affidavit to be true, and (ii) states why the other practitioner believes that the suspended or excluded practitioner has complied with paragraph (c) of this section.

§10.159 Notice of suspension or exclusion.

(a) Upon issuance of a final decision reprimanding a practitioner or suspending or excluding a practitioner from practice before the Office, the Director shall give notice of the final decision to appropriate employees of the Office and to interested departments, agencies, and courts of the United States. The Director shall also give notice to appropriate authorities of any State in which a practitioner is known to be a member of the bar.

(b) The Director shall cause to be published in the *Official Gazette* the name of any practitioner suspended or excluded from practice. Unless otherwise ordered by the Commissioner, the Director shall publish in the *Official Gazette* the name of any practitioner reprimanded by the Commissioner.

(c) The Director shall maintain records, which shall be available for public inspection, of every disciplinary proceeding where a practitioner is reprimanded, suspended, or excluded unless the Commissioner orders that the proceeding be kept confidential.

§10.160 Petition for reinstatement.

(a) A petition for reinstatement of a practitioner suspended for a period of less than five years will not be considered until the period of suspension has passed.

(b) A petition for reinstatement of a practitioner excluded from practice will not be considered until five years after the effective date of the exclusion.

(c) A practitioner who has been suspended or excluded may file a petition for reinstatement. The Director may grant a petition for reinstatement if the Director is satisfied that the suspended or excluded practitioner will conduct himself or herself in accordance with the regulations of this part and that granting a petition for reinstatement is not contrary to the public interest. As a condition to reinstatement, the Director may require a suspended or excluded practitioner to:

(1) Meet the requirements of §10.7, including taking and passing an examination under §10.7(b), and

(2) Pay all or a portion of the costs and expenses, not to exceed $1,500, of the disciplinary proceeding which lead to suspension or exclusion.

(d) Any suspended or excluded practitioner who has violated the provisions of §10.158 during his or her period of suspension or exclusion shall not be entitled to reinstatement until such time as the Director is satisfied that a period of suspension equal in time to that ordered by the Commissioner or exclusion for five years has passed during which the suspended or excluded practitioner has complied with the provisions of §10.158.

(e) Proceedings on any petition for reinstatement shall be open to the public. Before reinstating any suspended or excluded practitioner, the Director shall publish in the *Official Gazette* a notice of the suspended or excluded practitioner' s petition for reinstatement and shall permit the public a reasonable opportunity to comment or submit evidence with respect to the petition for reinstatement.

§10.161 Savings clause.

(a) A disciplinary proceeding based on conduct engaged in prior to the effective date of these regulations may be instituted subsequent to such effective date, if such conduct would continue to justify suspension or exclusion under the provisions of this part.

(b) No practitioner shall be subject to a disciplinary proceeding under this part based on conduct engaged in before the effective date hereof if such conduct would not have been subject to disciplinary action before such effective date.

§10.162-10.169 [reserved].

§10.170 Suspension of rules.

(a) In an extraordinary situation, when justice requires, any requirement of the regulations of this part which is not a requirement of the statutes may be suspended or waived by the Commissioner or the Commissioner's designee, *sua sponte,* or on petition of any party, including the Director or the Director's representative, subject to such other requirements as may be imposed.

(b) Any petition under this section will not stay a disciplinary proceeding unless ordered by the Commissioner or an administrative law judge.

July 24, 1984. GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Status of PTO Services

The following is an update of the status of PTO services for June 1984:

Service Item	FY 1984 Performance Goal (Calendar Days)	Actual	Comment
Filing Receipts:			
Patents	22	25	
Trademarks	30	76	Delay due to data entry difficulty in working off the backlog.
Patent/Trademark Copies:			
Window Coupons	5	52% within 5 days	Transition to new contractor causing some delays.
Mail Coupons	29	99% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		July 25, 1984	
Certified Copies:			
Trademark Registrations	30	21	
Applications-As-Filed	20	99% within 15 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	23	
Filing Reg. Certificates	3	4	
Assignments:			
Patents	25	21	
Trademarks	25	16	
Avg. Days from Issue Fee Payment to Issue Date	90-100	88	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 2 days late	
Patent Copies Available	Issue Date	On schedule	
Trademark Copies Available	Issue Date	Avg. 1 day late	
Trademark Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1.5 days late	
Trademark Regs. Mailed	Issue Date	On schedule	

*Figures include mail processing and delivery time.

IMPROVEMENTS TO SERVICES

• *Out-of-Town Request for Files*— Delays are being experienced in receiving files ordered from the Federal Records Center in Suitland, Md. Therefore, more time must be allowed when out-of-town requestors are ordering patented files or abandoned or registered trademark files in advance of their arrival in the area. Until recently, a five-day notice was sufficient to obtain a file located in the Federal Records Center. Now we are suggesting that ten days be allowed when ordering Suitland files. A 24-hour notice is still normally adequate when the file is located in the PTO File Repository in Crystal City. Out-of-town requests for files should be directed to Ms. Jacqueline Waldo on (703) 557-2977. Requestors will be notified by phone, prior to planned arrival date, whether or not the requested file will be available.

Aug. 6, 1984. THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

EXTENSION OF TIME FOR FILING NOTICES OF OPPOSITION TO MARKS PUBLISHED IN THE OFFICIAL GAZETTE DATED JULY 31, 1984

Copies of the Official Gazette dated July 31, 1984 were not mailed until August 9, 1984. Therefore, for marks published in the Official Gazette dated July 31, 1984, Notices of Opposition filed by September 10, 1984 will be considered timely.

8-15-84
(Date)

Margaret M. Laurence
Assistant Commissioner
for Trademarks

PATENT NOTICES

Certificates of Correction for the Week of Aug. 28, 1984

Re. 31,300	4,408,875	4,438,970	4,443,827
4,207,376	4,411,403	4,438,995	4,443,865
4,255,677	4,411,992	4,439,170	4,443,878
4,258,182	4,412,252	4,439,253	4,443,881
4,282,156	4,412,772	4,439,514	4,444,095
4,287,825	4,414,145	4,439,633	4,444,562
4,310,511	4,415,714	4,439,809	4,444,836
4,335,447	4,417,352	4,440,042	4,444,858
4,349,622	4,417,640	4,440,189	4,444,878
4,352,996	4,417,827	4,440,398	4,444,908
4,367,340	4,419,311	4,442,116	4,445,027
4,370,714	4,421,311	4,442,567	4,445,053
4,381,346	4,422,405	4,442,788	4,445,407
4,387,365	4,423,161	4,442,901	4,445,635
4,391,982	4,425,373	4,442,922	4,445,638
4,397,506	4,426,386	4,443,188	4,445,823
4,399,516	4,431,277	4,443,399	4,445,852
4,401,191	4,431,563	4,443,476	4,446,199
4,401,261	4,431,856	4,443,585	4,446,256
4,402,036	4,435,404	4,443,601	4,446,262
4,402,862	4,436,408	4,443,608	4,446,310
4,403,419	4,436,552	4,443,645	4,446,524
4,403,666	4,436,743	4,443,648	4,446,549
4,405,608	4,438,751	4,443,666	4,447,785
4,407,523	4,438,790	4,443,692	4,449,057
4,408,349	4,438,858	4,443,717	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 7, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-21-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	6-24-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-21-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	6-30-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-25-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	10-01-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-29-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-29-81
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	3-29-82
DESIGN, GROUP 290—K. L. CAGE, Director	4-02-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	9-14-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-29-81

Expiration of patents: The patents within the range of numbers indicated below expire during July 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,328,806 to 3,333,279, inclusive

Plant Patents . . . . . Numbers 2,750 to 2,755 inclusive

REEXAMINATIONS

AUGUST 28, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification: matter printed in italics indicates additions made by reexamination.

B1 3,776,715 (233rd)

HALOPHENOXY BENZOIC ACID HERBICIDES

Robert J. Theissen, Westfield, N.J., assignor to Rhone-Poulenc Agrochemie, Lyons, France

Reexamination Request No. 90/000,279, Oct. 28, 1982.

Reexamination Certificate for Patent No. 3,776,715, issued Dec. 4, 1973, Ser. No. 194,479, Nov. 1, 1971.

Division of Ser. No. 819,412, Apr. 25, 1969, Pat. No. 3,652,645.

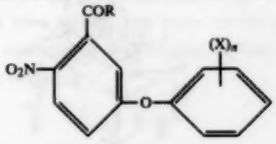
Int. Cl.³ A01N *9/20*

U.S. Cl. 71—111

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

1. The method for controlling plant growth the comprises applying an herbicidal amount of an herbicidal compound having the formula



wherein X is halogen, n is 1 to 5, and R is hydroxyl, alkoxy (C_1–C_3) or phenoxy.

B1 4,013,413 (234th)

APPARATUS AND METHOD FOR RAPID ANALYSES OF PLURALITY OF SAMPLES

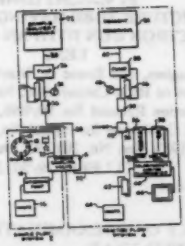
Kent K. Stewart, Silver Spring; Gary R. Beecher, Laurel, and Peter E. Hare, Takoma Park, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Reexamination Request No. 90/000,437, Aug. 24, 1983.

Reexamination Certificate for Patent No. 4,013,413, issued Mar. 22, 1977, Ser. No. 594,893, Jul. 10, 1975.

Int. Cl.³ G01N *1/00, 31/00, 35/08*

U.S. Cl. 436—53



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3, 7** and **8** are determined to be patentable as amended.

Claims **4–6**, dependent on an amended claim, are determined to be patentable.

New claims **9–22** are added and determined to be patentable.

1. An apparatus for rapidly analyzing a plurality of fluid samples, comprising a *segmented* sample flow system for introducing samples into the apparatus, [a reaction flow system into the apparatus,] a reaction flow system for introducing reagent and sample solvent into the apparatus and for reacting reagent and sample and analyzing the reacted sample, said reaction flow system having means for providing a continual flow of fluid at a constant rate through said system when the apparatus is in operation, and a stream sampling valve common to both the sample flow system and the reaction flow system for transferring a volume of sample only from the sample flow system to the reaction flow system, comprising a plurality of four-way valves, each having a plurality of ports and an element slidably mounted for movement within said valves, said elements being provided with fluid conducting conduits adapted to register with the aforesaid ports to control the flow of fluid through said valves, and a plurality of coils mounted externally of said valves to transport fluids to and from the valves, [thereby] *said valve* providing means for washing out the sample flow system while the valve is injecting a sample into the reaction flow system.

B1 4,017,170 (235th)

ELECTROPHOTOGRAPHIC DEVICE

Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Reexamination Request No. 90/000,315, Jan. 13, 1983.

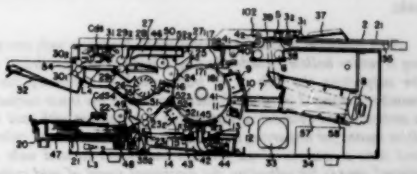
Reexamination Certificate for Patent No. 4,017,170, issued Apr. 12, 1977, Ser. No. 600,860, Jul. 31, 1975.

Continuation of Ser. No. 348,092, Apr. 5, 1973, abandoned.

Claims priority, application Japan, Apr. 13, 1972, 47-37288; Apr. 15, 1972, 47-38149; Jun. 20, 1972, 57-72961[U]

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–4**, dependent on an amended claim, are determined to be patentable.

New claim **5** is added and determined to be patentable.

1. An electrophotographic copying device comprising a photosensitive member, charging means *including at least one DC corona discharger* and exposing means for forming an electrostatic latent image on said photosensitive member, develop-

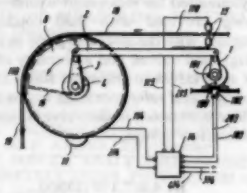
ing means for visualizing said electrostatic latent image, means for fixing said visible image, means for transporting copying paper, means for transferring said visible image onto said copying paper, *cleaning means, separate from said developing means, for cleaning the photosensitive member after the visible image has been transferred to the copying paper,* and means, *operable in the absence of any DC discharge being applied to the photosensitive member,* for making the surface potential of the photosensitive member substantially uniform after the termination of a copying cycle and before the complete cessation of operation of device.

B1 4,249,688 (236th)

DEVICE FOR INTERMITTENT FEEDING OF WEBS

Gerhard Klemm, Am Rehwinkel 37, 4800 Bielefeld 1, Fed. Rep. of Germany

Reexamination Request No. 90/000,119, Dec. 2, 1981.
Reexamination Certificate for Patent No. 4,249,688, issued Feb. 10, 1981, Ser. No. 21,819, Mar. 19, 1979.
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812099
Int. Cl.³ B65H *17/65*
U.S. Cl. 226—24



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2** and **14–17** are cancelled.

Claims **3**, **10**, **12** and **18** are determined to be patentable as amended.

Claims **4–9**, **11** and **13**, dependent on an amended claim, are determined to be patentable.

New claims **19–22** are added and determined to be patentable.

19. A transport device for intermittently feeding a web, comprising a rotary hollow cylinder having a perforated cylindrical wall for supporting the web to be transported; a stationary suction member arranged in said cylinder opposite to the inner surface of a section of the cylindrical wall which is in contact with said web; drive means for imparting an intermittent rotation to said cylinder and thus a predetermined forward movement to said web; and control means for adjusting the rotational speed of said cylinder within the limits of one feeding interval.

B1 4,274,686 (237th)

FREE ARM SEWING MACHINE CABINET MOUNTING MECHANISM

Ralph B. White, 2526 Castle Dr., Fort Wayne, Ind. 46816

Reexamination Request No. 90/000,267, Oct. 5, 1982.
Reexamination Certificate for Patent No. 4,274,686, issued Jun. 23, 1981, Ser. No. 56,547, Jul. 11, 1979.
Int. Cl.³ A47B *81/00*
U.S. Cl. 312—27

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–29** are cancelled.

New claims **30–38** are added and determined to be patentable.

30. In a sewing machine cabinet having a top with an opening therein, a mounting mechanism for supporting a free arm sewing machine selectively in an upper use position, a lower use position, and a storage position, said mechanism comprising:

an upper support arm pivotally connected to and depending from said cabinet top,

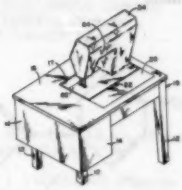
a lower support arm pivotally connected to said upper support arm,

a sewing machine support platform pivotally connected to said lower support arm,

lower use lock means for releasably locking said platform in a lower use position,

upper use lock means for releasably locking said platform in an upper use position, the upper use position of said platform being generally above the lower use position thereof,

said mechanism being movable to a storage position wherein the platform is positioned such that a sewing machine operably attached thereto would be disposed below the cabinet top,



a pair of brackets connected to said cabinet, a first rod connected to one of said upper support arm and said brackets and pivotally connected to the other of said upper support arm and said brackets so as to pivotally connect said upper arm to said cabinet top, and first spring means coiled around said first rod and connected to said upper arm for urging said upper arm in a direction causing said platform to move upwardly toward the upper use position, and

a second rod connected to one of said upper support arm and said lower support arm and pivotally connected to the other of said upper arm and said lower arm so as to pivotally connect said lower arm to said upper arm, and second spring means coiled around said second rod and connected to said lower arm for urging said lower arm to rotate in the same direction as said upper arm is urged to rotate.

B1 4,370,592 (238th)

COLOR PICTURE TUBE HAVING AN IMPROVED INLINE ELECTRON GUN WITH AN EXPANDED FOCUS LENS

Richard H. Hughes, and Bruce G. Marks, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

Reexamination Request No. 90/000,457, Oct. 7, 1983.
Reexamination Certificate for Patent No. 4,370,592, issued Jan. 25, 1983, Ser. No. 201,692, Oct. 29, 1980.
Int. Cl.³ H01J *29/50, 29/56*
U.S. Cl. 313—414

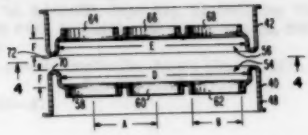
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **5**, **9** and **10** are determined to be patentable as amended.

Claims **2–4**, **6–8** and **11**, dependent on an amended claim, are determined to be patentable.

1. In a color picture tube [havinng] *having* an inline electron gun for generating and directing a plurality of electron beams along coplanar paths toward a screen of said tube, said gun including a main focus lens for focusing said electron beams, the improvement comprising

the main focus lens being formed by two spaced electrodes, each electrode including a portion having a plurality of



apertures therein equal to the number of electron beams, each electrode also including a peripheral rim, the peripheral rims of the two electrodes facing each other, the apertured portion of each electrode being within a recess set back from the rim, said recess having substantially straight wall sections parallel to the coplanar paths of the electron beams.

B1 4,396,391 (239th)

TREATING CELLULOSE TEXTILE FABRICS WITH DIMETHYLOL DIHYDROXYETHYLENEUREA-POLYOL

Bernard F. North, Rock Hill, S.C., assignor to Sun Chemical Corporation, New York, N.Y.

Reexamination Request No. 90/000,489, Jan. 23, 1984.
Reexamination Certificate for Patent No. 4,396,391, issued Aug. 2, 1983, Ser. No. 393,640, Jun. 30, 1982.
Filed Jan. 23, 1984, Ser. No. 393,640
Int. Cl.³ D06M *13/34*
U.S. Cl. 8—181

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 6 and 7 is confirmed.

Claims 1, 8 and 11 are determined to be patentable as amended.

Claims 2–5, 9, 10 and 12, dependent on an amended claim, are determined to be patentable.

1. A composition for treating a textile fabric which comprises the product of the reaction of (a) dimethyloldihydroxyethylene urea or an alkylated dimethyloldihydroxyethylene urea with (b) a polyol *selected from the group consisting of ethylene glycol, diethylene glycol, propylene glycols, butylene glycols, and glycerine, and their mixtures.*

REISSUES

AUGUST 28, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,652
METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

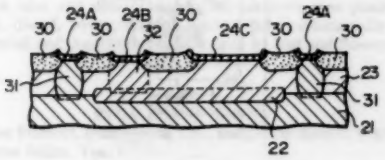
Osamu Hataishi, Yokohama; Yoshinobu Momma, Kitakami, and Ryoji Abe, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Original No. 4,343,080, dated Aug. 10, 1982, Ser. No. 155,122, May 30, 1980. Application for reissue Aug. 29, 1983, Ser. No. 527,498

Claims priority, application Japan, May 31, 1979, 54/67611

Int. Cl.³ H01L *21/22*

U.S. Cl. 29—571 **8 Claims**



7. A method of producing a semiconductor device comprising at least one semiconductor element and an isolation region, which are formed in an epitaxial layer formed on a semiconductor substrate having a buried layer, comprising the steps of:

forming an anti-oxidation masking layer on the epitaxial layer;

selectively removing the masking layer by etching to uncover portions of the epitaxial layer;

thermal-oxidizing the exposed portions of the epitaxial layer to form a thin oxide layer;

forming a patterned resist layer to selectively cover said masking layer;

introducing impurities into a predetermined portion of the epitaxial layer which is not under the resist layer;

removing the patterned resist layer; and

thermal-oxidizing the epitaxial layer by using the remaining anti-oxidation masking layer as a mask to form a thick oxide layer, at the same item the introduced impurities are diffused into the epitaxial layer to form the isolation region.

Re. 31,653
ELECTRONIC MUSICAL INSTRUMENT OF THE HARMONIC SYNTHESIS TYPE

Chifumi Takeuchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Original No. 4,256,004, dated Mar. 17, 1981, Ser. No. 32,092, Apr. 20, 1979. Application for reissue Sep. 30, 1982, Ser. No. 431,738

Claims priority, application Japan, Apr. 24, 1978, 53-48402

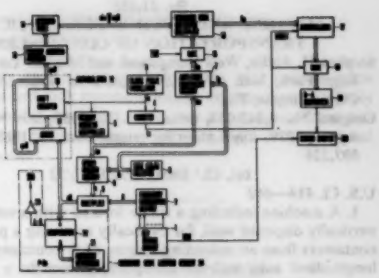
Int. Cl.³ G10H *1/06*

U.S. Cl. 84—1.21 **11 Claims**

10. In an electronic musical instrument of the type wherein a musical tone is synthesized in real time by computing sequential sample point amplitudes of the tone, the improvement comprising:

first means for calculating the constituent sample point amplitudes of a certain number of specified harmonic components and combining these to obtain each computed sample point amplitude, and

means for specifying, in response to the selection of a desired tone color, a subset of harmonic components the constituent amplitudes of which are to be included by said first means in each sample point amplitude computation, said subset containing less than all harmonic components between the fundamental and the calculated harmonic component of highest order value, said certain number being less than the order



value of said highest order harmonic component included in the sample point amplitude computation.

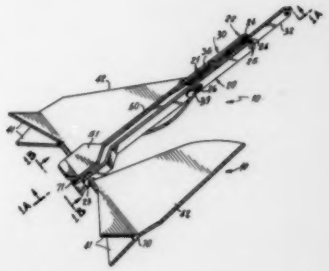
Re. 31,654
ANCHOR

Rudolph Fasco, 2210 SW. 100th Ave., Miami, Fla. 33165

Original No. 4,369,727, dated Jan. 25, 1983, Ser. No. 207,252, Nov. 17, 1980. Application for reissue Sep. 19, 1983, Ser. No. 533,442

Int. Cl.³ B63B *21/44*

U.S. Cl. 114—297 **9 Claims**



4. An anchor for a water vessel comprising:

an elongated rigid shank assembly;

a chain lever pivotally coupled intermediate its length to said shank assembly near one end of the latter, said chain lever on one side of its pivotal coupling to the shank assembly having means for attaching it to an anchor cable extending to the vessel, said chain lever having an end on the opposite side of said pivotal coupling;

a fluke assembly pivoted to said shank assembly near the opposite end of the latter from the chain lever;

a longitudinal bar member pivoted to said shank assembly near said opposite end of the latter and extending along said shank assembly and having a free end for overlying engagement with said end of the chain lever;

and means providing a lost-motion coupling between said bar member and said fluke assembly for moving said bar member into overlying engagement with said end of the chain lever in response to pivotal movement of said fluke assembly into

engagement with the bottom of the body of water where the vessel is located;

said chain lever, when pulled by the anchor cable to increase its angle to the shank assembly, moving its end out from beneath the free end of said bar member and permitting the latter to drop and through said lost-motion coupling enable said fluke assembly to pivot in the same direction as said bar member for releasing itself from the bottom.

Re. 31,655

MACHINE AND METHOD FOR VERTICAL TRANSPORTATION OF CONTAINERS

Stephen H. Aidlin, West Hempstead, and Michael Tartakowsky, Rego Park, both of N.Y., assignors to Aidlin Automation Corp., Airgate, Fla.

Original No. 4,242,033, dated Dec. 30, 1980, Ser. No. 25,891, Apr. 2, 1979. Application for reissue Jun. 23, 1983, Ser. No. 507,224

Int. Cl.[3] **B65G** *47/28, 47/52*

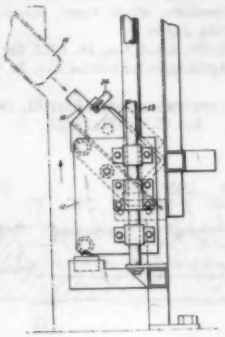
U.S. Cl. 414—662 **15 Claims**

1. A machine including a frame formed with a substantially vertically disposed wall, for cyclically receiving a plurality of containers from an unloading station, each container having a longitudinal axis, and for transporting them to a discharge station, said discharge station being spaced apart from, and above said unloading station by a predetermined distance, comprising in combination:

a platform connected to said frame, being operable in a first position thereof below said unloading station for accepting said containers, so that the longitudinal axis of each container subtends *in an initial position thereof at least* a predetermined *acute* angle with the horizontal, said platform being movable thereafter to a second position spaced substantially vertically above said first position for unloading said containers to said discharge station, said platform being movable thereafter to return *from said second position* to said first position,

guard means for restraining each of said containers from tumbling against said wall and impacting thereon *with a longitudinal side thereof* when being received by said platform, *said wall and said guard means thereafter maintaining each container in said initial position during an initial movement of said platform from said first position to said second position,*

control means connected to said platform for controlling the operation thereof, and



drive means for moving said platform [from said first position to said second position and vice versa] *between said first and second positions, and wherein said substantially vertically disposed wall has a predetermined height normally separating the containers loaded into said platform from said discharge station, whereby upon said containers being moved by said platform to a prearranged height above said predetermined height, said containers are allowed to slide from their normally occupied position onto said discharge station.*

PLANT PATENTS

GRANTED AUGUST 28, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,274

MINIATURE ROSE PLANT 'ROSY DAWN'

Cecelia L. D. Bennet, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 4, 1983, Ser. No. 464,031

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by bud and flowers.

5,275

ROSE PLANT 'GINNY'

Francis Bischoff, Indianapolis, Ind., assignor to John C. Walter, Grand Saline, Tex.

Filed Sep. 13, 1982, Ser. No. 417,412

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of rose plant of the miniature rose class, substantially as herein shown and described, characterized particularly by buds and flowers, which are generally white, edged with red in color, with many firm, thick petals, borne freely on a compact, bushy plant with reddish-green new foliage and dark green old foliage on branches with fairly short internodes, said plant being easy to propagate from cuttings, and said blooms being long-lasting both on the plant and as cut flowers.

5,276

PEACH TREE (HONEY BEE)

Chris F. Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Dec. 27, 1982, Ser. No. 453,770

Int. Cl.[3] A01H *5/03*

U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree as illustrated and described by its dwarf size (6 to 7 ft.), having spreading and dense growth with close leaf nodes, attractive foliage, large showy flowers and a productive and regular bearer of early maturing, large, yellow flesh, freestone fruit of excellent eating quality.

engagement with the bottom of the body of water where the vessel is located;

said chain lever, when pulled by the anchor cable to increase its angle to the shank assembly, moving its end out from beneath the free end of said bar member and permitting the latter to drop and through said lost-motion coupling enable said fluke assembly to pivot in the same direction as said bar member for releasing itself from the bottom.

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Int. Cl.[3] **B65G** *47/28, 47/52*

U.S. Cl. 414—662 **15 Claims**

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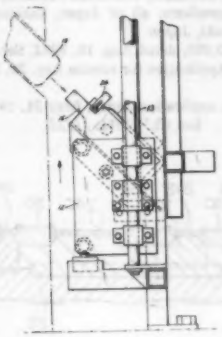
a platform connected to said frame, being operable in a first position thereof below said unloading station for accepting said containers, so that the longitudinal axis of each container subtends *in an initial position thereof at least* a predetermined *acute* angle with the horizontal, said platform being movable thereafter to a second position spaced substantially vertically above said first position for unloading said containers to said discharge station, said platform being movable thereafter to return *from said second position* to said first position,

guard means for restraining each of said containers from tumbling against said wall and impacting thereon *with a longitudinal side thereof* when being received by said platform, *said wall and said guard means thereafter maintaining each container in said initial position during an initial movement of said platform from said first position to said second position,*

control means connected to said platform for controlling the operation thereof, and



drive means for moving said platform [from said first position to said second position and vice versa] *between said first and second positions, and wherein said substantially vertically disposed wall has a predetermined height normally separating the containers loaded into said platform from said discharge station, whereby upon said containers being moved by said platform to a prearranged height above said predetermined height, said containers are allowed to slide from their normally occupied position onto said discharge station.*

PLANT PATENTS

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5,274

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Cecelia L. D. Bennet, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Feb. 4, 1983, Ser. No. 464,031

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, much branched habit, substantially as illustrated and described, characterized by bud and flowers.

5,275

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Filed Sep. 13, 1982, Ser. No. 417,412

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as herein shown and described, characterized particularly by buds and flowers, which are generally white, edged with red in color, with many firm, thick petals, borne freely on a compact, bushy plant with reddish-green new foliage and dark green old foliage on branches with fairly short internodes, said plant being easy to propagate from cuttings, and said blooms being long-lasting both on the plant and as cut flowers.

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Filed Dec. 27, 1982, Ser. No. 453,770

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U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree as illustrated and described by its dwarf size (6 to 7 ft.), having spreading and dense growth with close leaf nodes, attractive foliage, large showy flowers and a productive and regular bearer of early maturing, large, yellow flesh, freestone fruit of excellent eating quality.

PATENTS

GRANTED AUG. 28, 1984

ERRATA

For CLASS	See PATENT NO.
446–015	4,467,552
446–136	4,467,553
446–242	4,467,554
446–158	4,467,555
446–230	4,467,556
446–463	4,467,557
254–293	4,468,108
365–076	4,468,132
424–274	4,468,520
174–065	4,468,535
174–092	4,468,536
381–015	4,468,537
179–002	4,468,538
179–002	4,468,539
179–002	4,468,540
179–084	4,468,541
346–058	4,468,650

PATENTS

ISSUED AUG. 30, 1966

PATENTS

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PATENT NO.	
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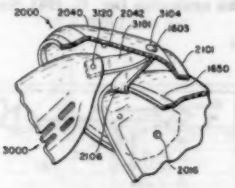
PATENTS

GRANTED AUGUST 28, 1984

GENERAL AND MECHANICAL

4,467,475
UPPER BODY PROTECTOR APPARATUS
John R. Gregory, 303 W. 35th St., Suite C, National City, Calif. 92050; Gerald Parks, 8991 W. Layton Ave., Denver, Colo. 80123, and John D. Dondero, P.O. Box 1017, Sun Valley, Id. 83353
Filed May 11, 1983, Ser. No. 493,736
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **11 Claims**



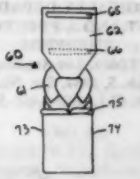
1. An upper body protector comprising:
a semirigid upper body shield having a chest plate portion, a back plate portion, and a main shoulder portion having left and right shoulder portions;
said chest plate portion adapted to conformably embrace the chest of a wearer;
said back plate portion adapted to conformably embrace the ribcage and lower back of the wearer;
said shoulder portion adapted to conformably embrace the shoulders of the wearer;
a pair of shoulder flaps hingedly connected to said upper body shield so that each of said shoulder flaps is superposed over respective left and right shoulder portions, each of said shoulder flaps being movable in an arcuate path between an uppermost position and a lowermost postion;
a pair of epaulets each being hingedly connected, respectively, to said shoulder flaps; and
locking means associated with each of said left and right shoulder portions and with each of said respective shoulder flaps for locking each of said shoulder flaps in a fixed position corresponding to said lowermost position so that a downward impact on each of said shoulder flaps is diffused, thereby reducing the force exerted on the shoulder of the wearer as a result of said impact.

4,467,476
BULLET-PROOF GARMENT
M. Linton Herbert, 216 Harbor View Ln., Largo, Fla. 33540
Continuation-in-part of Ser. No. 282,135, Jul. 10, 1981, Pat. No. 4,417,146. This application Oct. 11, 1983, Ser. No. 540,484
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.³ F41H *1/02*
U.S. Cl. 2—2.5 **12 Claims**

1. A bullet-proof garment comprising:
a. a garment fabricated from a flexible bullet resistent material and including
i. an upper section for shielding a wearer's torso including first and second apertures for the wearer's arms and a third aperture for the wearer's neck;
ii. a lower section for shielding the wearer's hip and thigh areas;
iii. a weight transfer region positioned adjacent to the wearer's upper hip area;
b. means for securing said weight transfer region to the wearer's upper hip area; and
c. means for transferring a substantial amount of the weight of said upper section through the weight transfer region to the wearer's hips, said weight transfer means including first and second U-shaped, vertical stiffeners coupled to said garment and extending upward through the weight

transfer region and the upper section of said garment, said first stiffener passing over the wearer's left shoulder and said second stiffener passing over the wearer's right shoulder.

4,467,477
FOLDABLE WEARING APPAREL
Alfred A. DeGennaro, 1492 Ocean Ave., Sea Brite, N.J. 07760
Filed Apr. 14, 1982, Ser. No. 372,912
Int. Cl.³ A41D *1/00*
U.S. Cl. 2—94 **9 Claims**



1. A garment with securable apparel side panels, which comprises:
a set of securing members on the front of said garment substantially perpendicular to the hemline of said garment and located substantially at the midpoints between each respective side seam of said garment and the front center line of the garment and running downward substantially from the shoulder seam to the hemline of the garment, a complementary set of securing members on the back of said garment for the purposes of attaching to the set of securing members on the front of said garment substantially perpendicular to the hemline of said garment and located substantially at the midpoint between each respective side seam of said garment and the back center line of the garment and running downward substantially from the shoulder region to the hemline of said garment; so constructed and arranged that each side of the garment can be placed between the front and back sections of said garment and the complementary securing members on each respective side of the garment can be secured to one

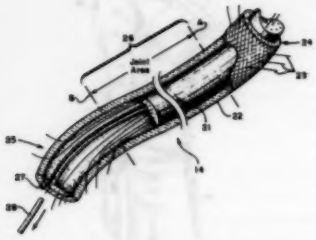
another and thereby secure the sides of said garment between the front and back sections.

4,467,478

HUMAN LIGAMENT REPLACEMENT

John A. Jurgutis, 506 Georgina Ave., Santa Monica, Calif. 90402

Filed Sep. 20, 1982, Ser. No. 419,712
Int. Cl.³ A61F *1/00*
U.S. Cl. 3—1 **7 Claims**



6. A human ligament replacement comprising, in combination:

(a) an animal tendon whose tissue has been bound by immersion in a fixing solution;

(b) a protective covering wrapped about said tendon; and

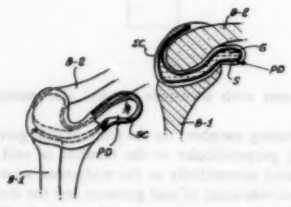
(c) absorbable sutures passing longitudinally through the tendon whereby after the tendon ends are grafted to the human bone portions formerly connected to the ligament being replaced and healing has begun, scar tissue can migrate into the openings left by the absorbable sutures to increase the strength and the securement of the tendon to said bone portions.

4,467,479

METHOD OF SURGICALLY REPAIRING AN INJURED HUMAN JOINT AND A PROSTHETIC DEVICE THEREFOR

Garry S. Brody, 219 Tilden, Los Angeles, Calif. 90049

Filed Feb. 5, 1982, Ser. No. 346,277
Int. Cl.³ A61F *1/04, 5/04*
U.S. Cl. 3—1.91 **5 Claims**



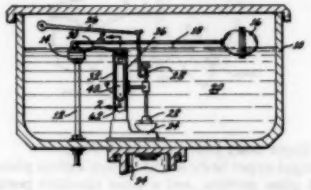
1. A method of surgically repairing an injured human joint with a prosthesis including the steps of providing a prosthesis comprising a balloon-like device having a U-like configuration and constructed of a synthetic, elastomeric material having a biologically tolerable material having a preselected pressure sensitive material partially filling the balloon, reshaping the injured tissues surrounding the joint, providing a space between the two opposing surfaces of the bones of said joint, positioning within said space said prosthesis and completely filling the joint space therebetween to maintain the distance between the two bone surfaces thereby permitting normal movement at said joint to thereby control the growth of new scar tissue around the joint during healing to prevent the new scar tissue from shrinking around the joint in a manner so as to restrict the normal movement of the joint after it healed.

4,467,480

TOILET BOWL WATER CONDITIONER

Philip B. Keller, 1527 Pontius Ave., Los Angeles, Calif. 90025

Continuation-in-part of Ser. No. 440,751, Nov. 12, 1982, abandoned. This application Dec. 12, 1983, Ser. No. 560,323
Int. Cl.³ E03D *9/02*
U.S. Cl. 4—225 **3 Claims**



3. For use in a toilet tank having an upwardly extending water inlet pipe capped by a float operated valve which valve, in its open position passes most of the water to refil the tank and a small quantity of water through a pipe extending horizontally to discharge the same into an open top overflow tube, the lower end of which overflow tube is in communication with the toilet bowl, to complete refilling of the bowl after flushing;

means to sanitize the water in the toilet bowl, said means comprising:

(a) a tubular receptacle disposed inside the overflow tube, said receptacle having a cross-section dimension sufficiently less than the inside diameter of said overflow tube to permit water to flow between the tubular receptacle and inner wall of the overflow tube, said receptacle having passage means for allowing water from said pipe to enter said receptacle;

(b) a transverse wall disposed in the vicinity of the lower end of said receptacle to form, with the tubular wall of the receptacle, a chamber, at least one of said transverse wall and said tubular wall of said chamber being provided with at least one small orifice to allow water, when contained in the chamber, to seep out of the chamber, said chamber being provided with a predetermined quantity of a water conditioning chemical and orificed transverse means at the upper end thereof to retain said chemical in the chamber when the latter is filled with water, said chemical being in such a state in said chamber as to permit water entering the chamber from the discharging pipe to pass through said transverse means and said chemical and dissolve a portion of said chemical, with the resulting solution then seeping through the small orifice into the overflow tube to pass into the toilet bowl; and

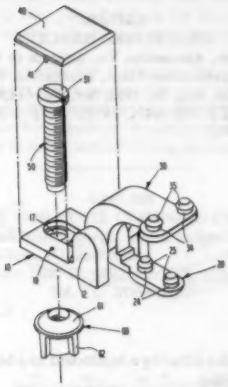
(c) means to suspend the receptacle in said overflow tube to provide communication between said pipe and said passage means and to provide a path for excess water between said receptacle and said pipe, whereby the chamber will become filled with water when discharge occurs from said pipe with the excess of the water required for such filling passing out over the upper end of the receptacle and directly down between the receptacle and the wall of the overflow tube surrounding the receptacle.

4,467,481

HINGE FOR TOILET SEAT

Milton Ginsburg, Bala Cynwyd, Pa., assignor to Ginsey Industries, Inc., Bellmawr, N.J.

Filed Sep. 29, 1982, Ser. No. 428,296
Int. Cl.³ A47K 13/12
U.S. Cl. 4—240 3 Claims



1. A hinge assembly for securing a toilet seat to a toilet bowl having bolt holes therethrough, said hinge assembly comprising:

a. a rearwardly extending base portion for attachment to the toilet bowl;

b. a forwardly extending lid leaf portion pivotally secured to said base portion;

c. a forwardly extending seat leaf portion pivotally secured to said base portion;

d. said base portion having at least one bolt hole therethrough;

e. an elongated bolt having a threaded end portion, said bolt adapted for insertion through the bolt holes in said base portion and bowl, and projecting from the bolt hole in said bowl the diameter of said bolt being substantially smaller than the diameter of said bolt hole, leaving an annular space in said hole surrounding said bolt;

f. a threaded nut for threading onto the threaded end of said bolt;

g. said nut having a conical nose of resilient material;

h. said conical nose having a forward portion which is smaller in diameter than the diameter of said bolt hole of said bowl, the rearward portion of said conical nose being larger in diameter than the diameter of said bowl bolt hole;

i. wherein when said nut is rotated in a tightening direction, said conical nose of said nut enters said annular space in said hole surrounding said bolt, and

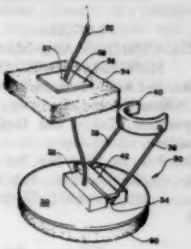
j. wherein further rotation of said nut in the tightening direction causes said threaded end of said bolt to occupy a central position in said bolt hole, the lower larger-diameter portion of said nose being in resistive engagement with the lower edge of said bolt hole and tending to inhibit free rotation of said nut in a loosening direction.

4,467,482

FLOAT VALVE ASSEMBLY

Arthur M. Dyer, 1949 Washington St., Lemon Grove, Calif. 92045

Filed Mar. 18, 1983, Ser. No. 476,581
Int. Cl.³ E03D 1/35
U.S. Cl. 4—393 8 Claims



8. A float valve assembly comprising:

a float member forming a valve for cooperating with a valve seat for opening and closing the flushing opening of an outlet coupling, the valve seat of said outlet coupling having a predetermined diameter and said float member having a diameter greater than that of said valve seat, the bottom portion of said float member that seats on said valve seat being formed of polyvinyl chloride foam material, the bottom surface of said float member being substantially flat;

adaptor means for detachably securing the float valve assembly to an overflow tube in a water closet tank;

flexible means for connecting the top of the float member to the free end of an actuating arm in a water closet tank; and

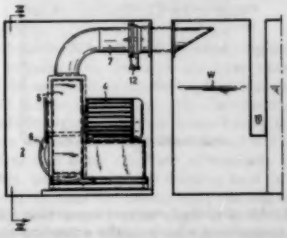
substantially rigid connecting members having one of their ends pivotally attached to said adaptor means and their opposite ends pivotally attached to the top of said float member at a location spaced inwardly a predetermined distance from the peripheral edge of said float member thereby preventing said connecting members from pivoting downwardly any farther than the top surface of said float member.

4,467,483

PNEUMATIC WAVE GENERATOR

Dirk Bastenhof, Langerak, Netherlands, assignor to Ecopool Design Limited, Channel Islands

Filed Feb. 24, 1983, Ser. No. 469,521
Claims priority, application Netherlands, Oct. 8, 1982, 8203906
Int. Cl.³ E04H 3/18; E02B 3/00
U.S. Cl. 4—491 10 Claims



1. A pneumatic wave generator for a surf pool, comprising a caisson divided into a plurality of wave generating chambers,

and a ventilator space with a source of compressed air capable of alternately effecting aspiration and expiration above the water surfaces in the wave generating chambers via a conduit system provided with air inlet and air outlet valves, characterized in that, in each of the wave generating chambers, the air inlet valve (8,13,37) and the air outlet valve (9,18,32) are coupled together and provided with a common drive (12,14, 34).

4,467,484

PNEUMATIC CUSHION AND MANUFACTURING METHOD THEREFOR

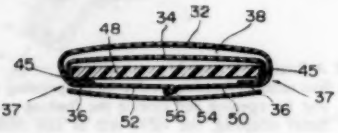
Hiroshi Nagatake, and Keiji Hayashi, both of Ashikaga, Japan, assignors to Nissan Motor Company, Limited, Kanagawa; Achilles Corporation, Tokyo and Ikeda Bussan Company, Limited, Kanagawa, all of, Japan

Filed Feb. 18, 1982, Ser. No. 349,788

Claims priority, application Japan, Feb. 19, 1981, 56-22560[U]

Int. Cl.³ A47C *27/08*

U.S. Cl. 5—449 **29 Claims**



1. A pneumatic cushion comprising:

an expandable air-tight bag like member having side walls defining a pneumatic chamber, said side walls including an air tight welded portion extending along the circumference of said chamber; and

means for isolating said welded portion from tension forces acting on the chamber side walls resulting from pneumatic pressure in said pneumatic chamber.

4,467,485

WATERBED MATTRESS WITH FREE FLOATING BAFFLE

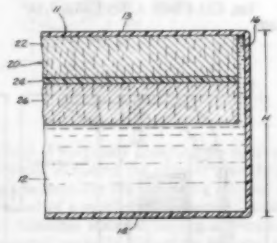
Charles P. Hall, Muir Beach, Calif., assignor to Monterey Manufacturing Co., Carson, Calif.

Continuation-in-part of Ser. No. 201,304, Oct. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 95,214, Nov. 19, 1979, Pat. No. 4,345,348, which is a continuation-in-part of Ser. No. 949,963, Oct. 10, 1978, Pat. No. 4,247,962. This application Apr. 3, 1981, Ser. No. 250,888

The portion of the term of this patent subsequent to Feb. 3, 1998, has been disclaimed.

Int. Cl.³ A47C *27/08*

U.S. Cl. 5—450 **5 Claims**



1. A foldable waterbed mattress comprising (a) an enclosing structure comprising a horizontally-extending top surface and a horizontally-extending bottom surface, and (b) a horizontally-extending baffle structure having a horizontal extent corresponding to the horizontal extent of the top surface of the mattress and unattached to the enclosing structure, the baffle structure comprising, a horizontally extending layer denser than water and a horizontally extending homogeneous sheet less dense than water, the sheet being substantially coextensive with the dense layer and having sufficient mass whereby the baffle structure floats spaced apart from the bottom surface when the mattress is filled with water, and wherein the entire waterbed mattress, including the baffle structure, can be folded for storage, the baffle structure permitting water to circulate between the top surface and the bottom surface.

4,467,486

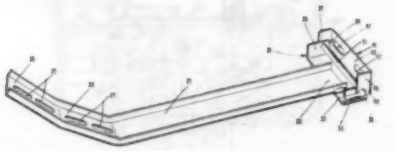
HEADBOARD BRACKET

Joshua G. Schatz, Alexandria, Va., assignor to Virginia Adjustable Bed Manufacturing Corp., Alexandria, Va.

Filed Aug. 26, 1982, Ser. No. 411,656

Int. Cl.³ F16M *11/00*; A47C *19/00*; A47F *5/00*; A47H *1/10*

U.S. Cl. 5—508 **11 Claims**



1. A bracket for securing a headboard to a base of a bed, the bracket comprising:

an elongated bar having a first angled section and a second angled section at a first end thereof, each section including at least one opening adapted to receive securement means for selectively fastening one of the sections substantially flush against a portion of the base;

a swing plate cooperating with a second end of the bar and adapted to be fastened to the headboard; and

pin means for releasably, swingably securing the swing plate to the second end.

4,467,487

SHOE UPPER CONFORMING MACHINE

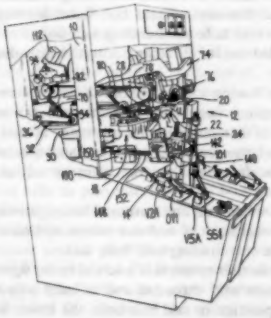
Frank Hartshorn, Wigston, England, assignor to USM Corporation, Farmington, Conn.

Filed Oct. 13, 1981, Ser. No. 311,483

Claims priority, application United Kingdom, Oct. 11, 1980, 8032926

Int. Cl.³ A43D *21/00*

U.S. Cl. 12—8.3 **16 Claims**



1. A shoe upper conforming machine for use in lasting side portions of shoe uppers comprising;

a last support on which a last, with a shoe upper thereon and an insole secured in the bottom thereof, can be supported,

a support for side lasting instrumentalities, and drive means for effecting relative movement, in a direction extending lengthwise of the shoe bottom, between the last support and the support for the side lasting instrumentalities whereby, in the operation of the machine, said instrumentalities are caused to operate progressively along the side portions of the shoe in a direction from the ball region of the shoe bottom to the heel breast line thereof, characterized by first setting means for controlling the operation of the drive means in such a manner that relative movement is caused to take place between the last support and the support for the side lasting instrumentalities at a first speed;

second setting means for controlling the operation of the drive means in such a manner that such relative movement is caused to take place at a second speed; and

selector means for selectively rendering operative a selected one of the first and second setting means.

4,467,488

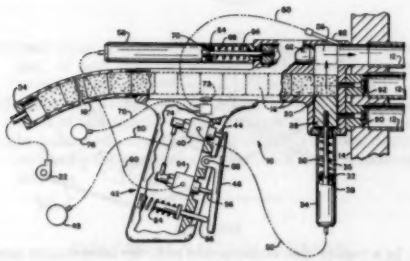
DEVICE FOR FINAL CLEANING OF TUBES

Ronald B. Creek, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 23, 1982, Ser. No. 452,550

Int. Cl.³ B08B 9/04

U.S. Cl. 15—3.5 **4 Claims**



1. In combination, apparatus for inserting cleaning plugs into the ends of tubes to be cleaned including a tool, handle means on the tool capable of being held by an operator, chamber means having an open end capable of being aligned with the open end of a tube to be cleaned, a first ram opposite the open end, a first piston-cylinder capable of moving the ram through the chamber means and retracting it therefrom thereby forcing a cleaning plug into the tube, a magazine opening laterally from the first ram and open end into the chamber means, a second ram positioned so as to move cleaning plugs from the magazine into the chamber means, a second piston-cylinder capable of moving the second ram through and retracting it from the magazine, means housing a chain of cleaning plugs, the means opening into the magazine, means maintaining a constant pressure on the chain of cleaning plugs so as to force a cleaning plug into the chamber when nothing else occupies it, and trigger means on the handle means which in a first position pressurizes the second piston-cylinder, and in a second position pressurizes the first piston-cylinder.

4,467,489

PORTABLE DRILL PIPE CLEANING APPARATUS

Donald M. Begneaud, 218 Supply Rd., Lafayette, La. 70506

Filed Mar. 22, 1982, Ser. No. 360,602

Int. Cl.³ B08B 9/02

U.S. Cl. 15—88 **11 Claims**

1. A hand held power brush pipe thread cleaner comprising:

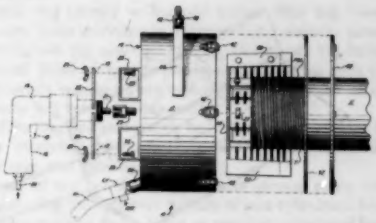
a. a rotary gun having a rotary power shaft, a handle for gripping, and a trigger proximate said handle for actuating said shaft to rotate;

b. a circular baffle plate mounted securely to said gun and having an opening therethrough through which said rotary shaft passes at least in part during operation with some clearance allowing rotation of said shaft with respect to said plate;

c. a cylindrical shroud affixed to the periphery of said baffle plate forming therewith a closed end portion of said shroud adjacent said gun, the opposite end of said shroud being an open end portion thereof;

d. fluid inlet means mounted on said shroud handle for receiving a supply of flowing cleaning fluid to be dispensed into said shroud;

e. seal means removably placed over said shroud at the open end portion thereof, and having a central opening through which the threaded end of a joint of pipe to be cleaned can pass the opening approximating the outer diameter of a



joint of pipe to be cleaned for forming a seal about a joint of pipe to be cleaned so that cleaning fluid is retained within the shroud; and

f. a structurally integral brush carriage mounted securely yet removably to said shaft for rotation therewith, said carriage comprising:

i. a generally circular hub having a hub opening to which said shaft attaches during operation;

ii. a plurality of inwardly facing brush holding structural channels each having a channel web and a pair of channel flanges defining a recess for carrying brushes, the channels being rigidly secured radially about the periphery of said hub and being mounted at one end to the hub with the channel recesses facing the shaft; and

iii. means for structurally supporting the channels at a position spaced from the hub including a plurality of gussets rigidly connecting webs of adjacent channels, each gusset being spaced from the surface of the baffle plate.

4,467,490

AIRFOIL SURFACE MULTISTATE PRECIPITATION REMOVAL TOOL

Bruce M. Adams, 704 Felipe Pl., Santa Fe, N. Mex. 87501

Filed Dec. 22, 1982, Ser. No. 452,384

Int. Cl.³ B60S 3/00; A47L 1/06

U.S. Cl. 15—105 **33 Claims**

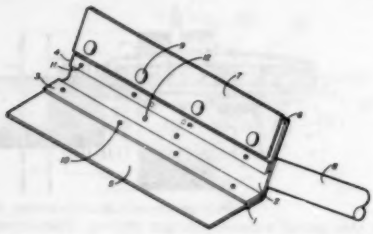
1. A tool operable with a handle for removing crusty frost, snow, slush, freezing rain, and light ice from aircraft airfoil surfaces, and for removing and polishing frost thereon without damaging said surfaces, which comprises in combination:

a. a substantially rigid rectangular frame having a first outer edge and a second outer edge wherein said first outer edge and said second outer edge are substantially parallel to each other, and wherein said frame is bent at an obtuse angle along an inner line substantially parallel to said first outer edge and second outer edge so as to form a first rectangular region containing said first outer edge and a second rectangular region containing said second outer edge;

b. a first scraping member for removing crusty frost, snow,

and light ice from said airfoil surfaces, said first scraping member being relatively stiff and having a scraping edge and a second edge parallel to thereto and opposite said scraping edge, and comprising a rectangular sheet fabricated from at least one material having a room temperature Durometer hardness value included within the range from approximately 63D to 72D, wherein said hardness value changes by less than about 10% over the temperature range from approximately 0° to −40° C., said material further having a room temperature Clash-Berg Modulus of Rigidity included within the range from about 13,500 to 19,000 psi, wherein said modulus changes by less than a factor of about seven (7) over the temperature range from approximately +23° to −40° C.;

c. means for substantially rigidly and demountably locating said first scraping member onto said first rectangular region such that said first scraping member extends outward with respect to said inner line and beyond said first outer edge;



d. a second scraping member for polishing frost on said airfoil surfaces said second scraping member being more flexible than said first scraping member and having a scraping edge and a second edge parallel thereto and opposite said scraping edge and comprising a rectangular sheet fabricated from at least one material having a room temperature Durometer hardness value included within the range from approximately 40D to 55D, wherein said hardness value changes by less than about 13% over the temperature range from approximately 0° to −40° C., said material further having a room temperature Clash-Berg Modulus of Rigidity included within the range from about 2100 to 8800 psi, wherein said modulus changes by less than a factor of four (4) over the temperature range from approximately +23° to −40° C.; and

e. means for substantially rigidly and demountably locating said second scraping member onto said second rectangular region such that said sraping member extends outward with respect to baid inner line and beyond said second outer edge.

4,467,491

REVERSIBLE HAIR AND CLOTHING BRUSH

Paul R. Dekker, Beethovenstraat 9, 1077 HL Amsterdam, Netherlands

Filed May 23, 1983, Ser. No. 496,944
Int. Cl.³ A46B 7/02
U.S. Cl. 15—106 **3 Claims**

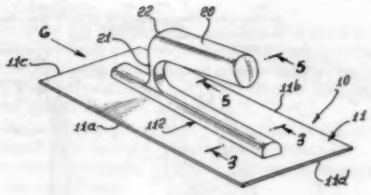
1. A combination hair and clothing brush comprising a first brush with rows of bristles, said rows of bristles are separated and offset from one another a distance whereby folding of said bristles towards each other will not cause interference between said rows of bristles, a liner supports said bristles underlying a bed, said bristles are secured to said bed, a second brush with a cleaning material surface whereby dust and dirt are removed from an article by stroking in one direction, said dust and dirt are removed from said material by stroking against said article in the opposite direction of said first stroke, said cleaning material is a flexible, resilient material, a brush body which contains said first brush and said second brush, said brush body having two sections, said two sections are joined at one edge by pivoting means and are joined at an opposite edge by clasping means, said first brush and said second brush are secured to each other and both are secured to said brush body, a cavity formed between said first brush, said second brush and said brush body is filled with a resilient supporting means, whereby upon pivoting of said brush body sections around said pivoting means either of said first brush or said second brush is taunt and exposed .nd the other brush is unexposed and is folded within said brush body.

4,467,492

TROWEL TYPE CONSTRUCTION TOOL

Eugene M. Harrington, 3672 Holboro Dr., Los Angeles, Calif. 90027

Filed Apr. 4, 1983, Ser. No. 481,991
Int. Cl.³ B05C 17/10; E04F 21/16
U.S. Cl. 15—235.4 **8 Claims**



1. In a trowel type construction tool, the combination comprising

(a) a metal blade extending longitudinally and generally horizontally,

(b) a longitudinally extending metallic rib attached to the upper side of the blade,

(c) a metallic strut having

(i) a lower portion integral with the rib

(ii) an upstanding intermediate portion

(iii) a generally horizontally extending upper portion,

(d) solid synthetic resinous material molded about said strut upper portion to form a handle,

(e) the synthetic resinous material also molded about and over the rib and said lower portion of the strut to conceal same, the metal rib having retention surfaces engaged by said material and acting to retain said material to the blade.

4,467,493

LATCHING ARRANGEMENT FOR A FLOOR CARE APPLIANCE WITH MOUNTED ACCESSORY APPLIANCE

Dean H. Buchtel, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Sep. 16, 1982, Ser. No. 418,731
Int. Cl.³ A47L 9/00
U.S. Cl. 15—323 **6 Claims**

1. A floor care appliance and accessory appliance including;

(a) a latching arrangement for maintaining said accessory appliance with said floor care appliance;

(b) said latching arrangement including a catch engageable in a linearly extending slot in said accessory appliance;
(c) said catch moving linearly relative to the linear extent of said slot;
(d) said latching arrangement including an operator -engageable linkage having a thrust link disposed adjacent to said catch and moving with said linkage to move said catch linearly relative to said slot;

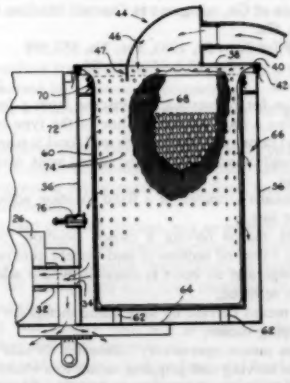
(e) said thrust link pivoted to a swinging link also forming a part of said latching arrangement, said swinging link swinging with said linkage to move said catch;
(f) a spring attached to said linkage to urge against movement of said linkage in one direction of movement, and
(g) a locking link attached to said swinging link and carrying said catch for movement of said catch linearly relative to said slot.

4,467,494

INDUSTRIAL VACUUM CLEANER

Judson O. Jones, 6 Persimmon La., Greenville, S.C. 29609

Filed Apr. 19, 1982, Ser. No. 369,572
Int. Cl.³ A47L 9/14
U.S. Cl. 15—353 **4 Claims**



1. An industrial vacuum cleaning system for collecting fibers containing lint and the like using said collected fibers as a filtration medium for subsequent lint laden air collected comprising:

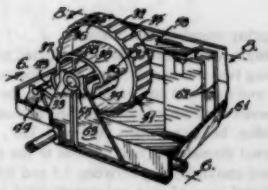
a positive displacement vacuum pump;
a motor driving said positive displacement vacuum pump producing a high vacuum;
a vertically extending cylindrical housing having a closed bottom, and side wall, and an open top;
a removable top extending over said open top;
a vacuum hose;
a vacuum hose receiver carried on said removable top having an opening communicating with the interior of said cylindrical housing through which media collected by said vacuum hose passes into said cylindrical housing;
a cleaning head carried on a remote end of said vacuum hose;
a rigid cylindrical mesh liner carried in said housing of a smaller size than said cylindrical housing producing a space between said cylindrical housing and said mesh liner;
a porous woven filter bag carried in said mesh cylindrical liner; and
a plastic bag carried within said woven filter bag having spaced holes provided in a substantially uniform pattern throughout the entire plastic bag, said plastic bag having spaced holes of approximately one-half of an inch (½") uniformly spaced throughout with the remainder of said plastic bag being non-porous;
said filter bag and said plastic bag each having an open top for receiving media entering said cylindrical housing through said vacuum hose, and
an input of said positive displacement vacuum pump communicating with a lower portion of said cylindrical housing for drawing media-laden air into said cylindrical housing, through said holes provided in said plastic bag, said porous woven filter bag, said mesh liner and through the space provided between said cylindrical mesh liner and the inner wall of said cylindrical housing.
said positive displacement vacuum pump producing a positive air flow causing said media entering said plastic bag to first cover said holes provided in said plastic bag and compacting said media extending over said holes filtering any subsequent media-laden air entering said cylindrical housing producing a tightly compacted bag of media while said positive displacement vacuum pump maintains a constant high vacuum at said cleaning head.

4,467,495

VACUUM CLEANER NOZZLE LIFT DEVICE

Warren H. Fish, Ramsey, and Robert P. Sunnarborg, Anoka, both of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 7, 1982, Ser. No. 433,370
Int. Cl.³ A47L 5/34
U.S. Cl. 15—354 **12 Claims**



8. In a vacuum cleaner nozzle having a housing defining an air suction passage and supported for movement over a surface being cleaned and a front end having a rotoary brush contacting said surface through a bottom nozzle opening in said housing, an improved front wheel height adjuster comprising:
(a) a supporting wheel engaging said surface and located rearwardly of said front nozzle opening;
(b) a hinged support lever for said wheel extending rear-

wardly thereof and hingedly mounted on said housing for arcuate movement of said wheel relative to said housing;

(c) an integral thumb wheel, lifting cam and locking ratchet unitary member having the lifting cam and locking ratchet on opposite sides of said thumb wheel;

(d) a cam follower engaging said cam and said support lever for moving said support lever and front wheel relative to said housing for adjustably moving the position of the rotary brush relative to said surface; and

(e) a spring urged pawl engaging said ratchet for holding the cam in fixed adjusted position against rotation thereof, said thumb wheel, cam and locking ratchet being coaxial with each other and with an axis of rotation, said lifting cam extending for 360° to provide a cam surface having a plurality of cams with lifting peaks symmetrically arranged around said axis for causing a corresponding plurality of cycles of operation for each 360° rotation of the cam, said unitary member being rotatable about an axis of rotation with said thumb wheel, lifting cam and locking ratchet being coaxial with said axis of rotation, said lifting cam and locking ratchet of said unitary member having hollow and provided with strengthening ribs on the interior of each, said ribs being arranged substantially radially to said axis of rotation, whereby said wheel may be moved to variable extended positions relative to said housing as said cam follower is movably engaged by said lifting peaks.

4,467,496

HEAVY DUTY POLYMERIC SPRING MEMBER AND COMBINATION OF SPRING AND CASTOR CONSTRUCTION

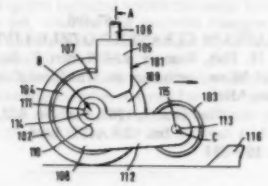
John D. W. Gregg, Newtownabbey, Northern Ireland, assignor to Wheel Developments Limited, Belfast, Northern Ireland

Filed Nov. 9, 1981, Ser. No. 319,395

Claims priority, application United Kingdom, Nov. 10, 1980, 8036045; Nov. 10, 1980, 8036046

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—18 B **9 Claims**



1. A spring member comprising:

(a) a single, substantially circular molded polymeric annulus having two side surfaces and a gap located between a first end and a second end of said annulus, the angle subtended between the ends of said annulus, as measured about said annulus, being between 200° and 350°, the ratio of the internal diameter of said annulus to the external diameter of said annulus being between 1:3 and 4:5, the total cross-sectional area of said annulus divided by the difference between the external radius of said annulus and the internal radius of said annulus being between one half and twice the difference between said radii, said spring member further comprising an integrally molded member extending from each of said annulus ends and adapted to be attached to means for exerting a force on said spring, and means located on at least one side of said annulus for resisting twisting of said annulus.

4,467,497

METHOD AND DEVICE FOR THE PRODUCTION OF THIN SLICES OF FROZEN MEAT SUITABLE FOR ROASTING OR GRILLING

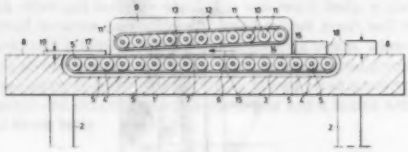
Lars-Eric Peterson, Roslagsgatan 50-52 C, S-113 54 Stockholm, and Jan Soderlind, Tallvagen 8 A, S-191 41 Sollentuna, both of Sweden

Continuation of Ser. No. 151,735, May 20, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,467

Claims priority, application Sweden, May 7, 1980, 8003443

Int. Cl.³ A22C *7/00*

U.S. Cl. 17—45 **4 Claims**



1. A method of forming a thin, integral piece of frozen meat suitable for food preparation using a pair of mutually facing conveyor belts, each of which is passed over a plurality of rigid rollers spaced apart in the longitudinal direction of said belts, said spaced rollers being arranged in opposing pairs to provide a plurality of nips of gradually decreasing size longitudinally of said belts, the method comprising the steps of:

passing a relatively thick, flat, frozen integral piece of meat between said belts and through said nips while maintaining said piece of meat frozen to substantially reduce the overall thickness of the entire piece of meat;

reducing the thickness of the piece of meat a predetermined amount by each successive nip, wherein said predetermined amount is controlled substantially to prevent damage to the connective tissue in the piece of meat and loss of meat juice and blood therefrom, at a rate of between 0.7 mm/sec and 5.0 mm/sec; and

introducing the piece of meat to each said nip before the piece of meat expands to the thickness thereof when it entered the next-preceding nip and before the piece of meat exits the next-preceding nip.

4,467,498

ROTARY VISCERA HARVESTER

Johnny R. Graham, Gainesville, and Kenneth Z. Graham, Dawsonville, both of Ga., assignors to Cantrell Machine Co., Inc., Gainesville, Ga.

Filed Nov. 21, 1983, Ser. No. 553,508

Int. Cl.³ A22C *21/06*

U.S. Cl. 17—45 **27 Claims**

1. Apparatus for harvesting the viscera from a fowl being processed along a food processing line of the type having an overhead fowl conveyor from which said fowl is suspended in an inverted position with an upward facing vent, said apparatus comprising:

(a) frame means arranged at a fixed location adjacent said conveyor line;

(b) gripping means having a closed position for tightly clamping a desired section of said viscera generally without slippage and an open position in which said viscera section is released;

(c) carrier means carried by said frame means for carrying said gripping means;

(d) insertion means operatively connected to said gripping means for moving said gripping means to a viscera clamping position inside an interior cavity of said fowl;

(e) said carrier means moving said gripping means a predetermined lateral distance generally in the direction of fowl conveyance along with said fowl while said gripping means is inserted in said fowl;

(f) actuator means for moving said gripping means from said open position to said closed position while inserted in said fowl cavity for clamping said viscera of said fowl;

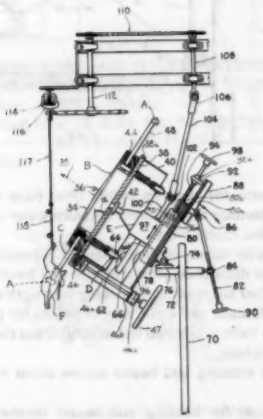
(g) retraction means operatively connected to said gripping means for retracting said closed gripping means so that said viscera is completely separated and removed from said carcass of said fowl;

(h) said actuator means moving said gripping means to said open position after retraction of said gripping means from said fowl to release said viscera;

(i) said carrier means including a rotating hub means carried by said frame means at said fixed location adjacent said fowl conveyor;

(j) radical connector means carrying said gripping means extending radially outwardly from said rotating hub; and

(k) mounting means for rotatably mounting said hub means adjacent said fowl conveyor so that said radial connector means are rotated in a plane inclined to the horizontal to bring adjacent radially carried gripping means into penetrating alignment with fowl carcasses passing successively by said rotating hub means.



14. A method for processing the viscera of a fowl carcass being processed on a conveyor comprising:

providing a plurality of gripping devices for grasping said viscera;

rotating said gripping devices in a generally circular motion in an inclined generally circular path having an upper portion and a lower portion at a fixed location adjacent said conveyor;

inserting said gripping devices into an interior cavity of said fowl carcasses at said lower portion of said circular path by said circular motion sequentially in synchronization with the passages of said fowl carcasses conveyed past said location;

grasping said viscera with said gripping devices while inserted in said fowl carcass;

retracting said gripping devices from said fowl carcasses by said circular motion as said gripping device moves away from said lower portion towards said higher portion so that said viscera is pulled from said fowl carcass; and

releasing said viscera from said gripping device after said retraction of said gripping device.

4,467,499

STUFFING METHOD AND APPARATUS

John H. Beckman, Downers Grove; George C. Haettinger, La-grange, and Vytautas Kupcikevicius, Chicago, all of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed May 1, 1981, Ser. No. 261,313
Int. Cl.³ A22C *11/00*
U.S. Cl. 17—49 **28 Claims**

1. A shirred tubular casing article comprising in combination, a tubular support, means for mounting the tubular support on a stuffing machine, a compacted shirred casing supply on the tubular support and frictionally engaging the tubular support, and internal holdback means associated with the discharge end of the tubular support for exerting a holdback force on the casing during stuffing, wherein said internal holdback means is a tiltable ring pivotable about the tubular support, whereby pivoting of the ring varies the holdback force exerted on the casing to control stuffing pressure.

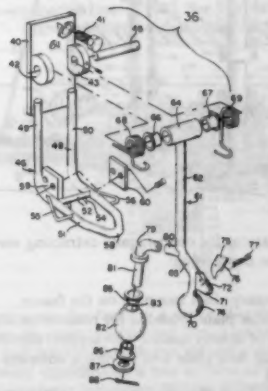
19. A method of controlling stuffing pressure in a casing stuffing operation, comprising the steps of engaging the inside of the casing with an internal holdback means which is movably mounted for movement between at least two positions for producing casing holdback forces of two magnitudes, and controlling the position of the internal holdback means within the casing by manipulating the internal holdback means through the casing with an external controller acting against the outside of the casing as a means of controlling stuffing pressure.

4,467,500

BIRD OPENING METHOD AND APPARATUS

Harold D. Olson, Smyrna, Ga., assignor to Cagles, Inc., Atlanta, Ga.

Filed Dec. 27, 1982, Ser. No. 453,617
Int. Cl.³ A22C *21/06*
U.S. Cl. 17—52 **3 Claims**



1. Apparatus for cutting open the body cavity of a bird wherein a plurality of birds are suspended in an inverted attitude and are moved in series on an elevated conveyor system, said apparatus comprising a carrousel framework rotatable

about a vertical axis in timed response to the movement of the conveyor system, a plurality of bird receiving stations equally spaced about said framework, each said bird receiving station including a vertically extending guide means, a carrier member movable vertically along said guide means, a bird hold-down member carried by said carrier and arranged to move downwardly to rest on the tail portion of a bird between the legs of a bird, cleat members extending downwardly from said bird hold-down member for frictionally engaging and holding the tail portion of the bird in a static position, a cutting assembly pivotably mounted about a horizontal axis to said carrier and including a cutting element arranged to pivot in an upward arc radially away from the vertical axis of said framework, said cutting element being sized and shaped for insertion in a previously formed opening at the tail portion of the bird, cam means resonsive to the movement of the bird receiving station about said framwork for moving said cutting element through an upward arc radially away from the vertical axis of said framework to cut the tail portion of the bird about previously formed opening to increase the size of the opening.

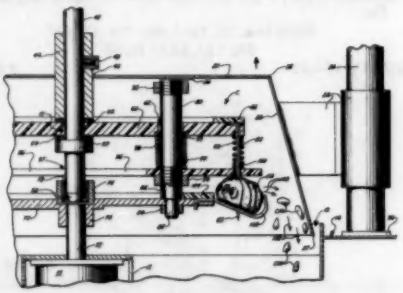
3. In a process for enlarging the opening formed about the vent of a bird wherein the bird is suspended in an inverted attitude and a cutting blade is inserted into the previously cut opening of the bird, the improvement comprising moving a hold-down frame with downwardly extending cleats in a downward direction toward the bird until the cleats engage the bird as the cutting blade is inserted into the opening of the bird, and moving the cutting blade in an upward arc to cut through the bird as the cleats restrain lateral movement of the bird.

4,467,501

APPARATUS FOR CENTRIFUGALLY EXTRACTING CRABMEAT FROM CRABS

Alfred R. Guglielmo, 6125 Villa Ashley Dr., Baton Rouge, La. 70806, and John B. Coast, Baton Rouge, La., assignors to Alfred R. Guglielmo, Baton Rouge, La.

Filed Feb. 10, 1983, Ser. No. 465,469
Int. Cl.³ A22C *29/00*
U.S. Cl. 17—71 **7 Claims**



1. An apparatus for centrifugally extracting meat from crab body sections comprising:

a frame;

a driven rotary shaft mounted on the frame;

a first annular plate mounted for rotation on the shaft;

a plurality of closely spaced wire support members radiating from said first plate and having a common path during rotation;

a second annular plate movably mounted on the frame with respect to the first plate between "loading" and "spinning" positions;

a plurality of closely spaced radially positioned pointed spikes depending from said second plate and positioned to intersect the path of rotation of the wire support members in the "spinning" positions, the spikes being spaced from the path in the "loading" position; and

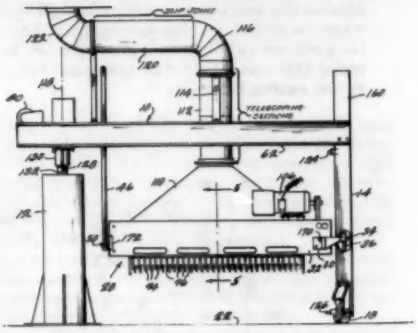
means for forming a connection between the first and second annular plates so that rotational force can be transferred from the first plate when rotated to the second plate.

4,467,502

FIBER BALE OPENER

Glenn E. Lytton, Belmont; Jerry R. Fair, and Ronald S. Nash, both of Gastonia, all of N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.

Continuation of Ser. No. 247,999, Mar. 26, 1981, abandoned.
This application Aug. 27, 1982, Ser. No. 412,188
Int. Cl.³ D01G *13/00*
U.S. Cl. 19—80 R **7 Claims**



1. Apparatus for opening textile fiber bales disposed on a floor in an annular area defined between outer and inner concentric circles, comprising:

rotary beater means having a length substantially equal to the radii difference of said circles and having a multiplicity of fiber stripping spikes along its length and around its circumference and a plurality of means for pressing down on fiber bales while said spikes strip fibers therefrom as the beater rotates,

means for rotating said beater means about its longitudinal axis,

frame means for holding said beater means in the radial direction of and superposed between said circles,

means for rotating said frame means about the center of said circles to cause said beater means to sweep over said floor in said radial direction superposed between said circles,

up/down means for raising and lowering said beater means in said frame means relative to said floor, and

automatic means cyclically operative after each time said frame rotating means has operated for a given period of rotation for automatically lowering said beater means by said up/down means toward said floor a predetermined distance.

4,467,503

ENLACEABLE SERVIETTE

Stephanie W. Boynton, 6465 Danette St., Simi Valley, Calif. 93063

Filed Mar. 21, 1983, Ser. No. 477,167
Int. Cl.³ A47G *11/00*
U.S. Cl. 24—7 **8 Claims**

1. An enlaceable serviette, foldable into a decorative pattern for presentation at a table setting and unfoldable for use during a meal, the enlaceable serviette comprising:

a napkin foldable into the decorative pattern and

a tie integrally attached to said napkin, said tie being for

securing the decorative pattern by enlacing and fastening said tie being about said folded napkin, said enlaced tie

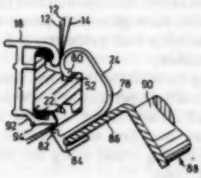
unfastenable for unfolding said folded napkin for use during the meal.

4,467,504

FASTENER KIT FOR SHEET MATERIALS

Robert Quist, Grimsby, Canada, assignor to Westbrook Greenhouses Limited, Grimsby, Canada

Filed Nov. 25, 1981, Ser. No. 324,730
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—462 **7 Claims**



1. A fastener kit for securing flexible sheet material to a structure, comprising:

an elongate channel member securable to the structure and having a longitudinal channel accessed by a longitudinal mouth;

an elongate lock member shaped to be longitudinally aligned with the mouth of the channel member with a portion of a first sheet material disposed between the channel and lock members, and then to be forced into the channel in releasably interlocking engagement with the channel member whereby the portion of the first sheet material is secured between the channel and lock members; and,

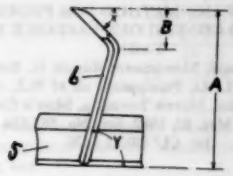
an elongate clip member having first and second longitudinal gripping portions and a body portion extending between the first and second gripping portions, the clip member being formed of a rigid material sufficiently elastic and so shaped that the body member can be elastically flexed to place the first and second gripping portions into gripping engagement respectively with the lock and channel members with a portion of a second sheet material secured between the clip, channel and lock members, the clip member thereafter remaining secured to the channel and lock members until the body portion is once again elastically flexed to release the gripping portions from the channel and lock members.

4,467,505

RAISING MACHINE FOR PRODUCING SUEDE TONE FINISH WITH DIAMOND-SHAPE CROSS-SECTION WIRES ON THE COUNTER PILE ROLLERS

Toru Mitsuyoshi, Amagasaki, and Yasuyuki Uchida, Kobe, both of Japan, assignors to Hiroyuki Kanai, Ashiya, Japan

Continuation of Ser. No. 082,591, Oct. 19, 1979, abandoned.
This application Jun. 9, 1982, Ser. No. 387,266
Claims priority, application Japan, Oct. 13, 1978, 53-141349[U]
Int. Cl.³ D06C *11/00*
U.S. Cl. 26—33 **3 Claims**



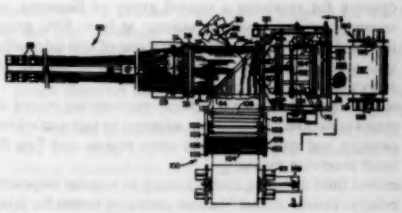
1. A raising machine for producing a suede tone finish of short pile and high nap desnity on cloth having a set of counter pile rollers and a set of pile rollers, and raising machine wire clothing on said counter pile rollers and having wires of substantially diamond-shape cross-section of four equal sides enclosing two obtuse and two acute angles and a radius of less than 0.1 mm at the acute angle corners of the cross-section of the wire, the acute angle corners of the cross-section of the wires facing in the direction of rotation of the rollers of said set of counter pile rollers, and the wires on said pile rollers having a circular cross-section, whereby, by the use of said sets of rollers, short piles drawn out by the clothing of the pile rollers are cut by the clothing of the counter pile rollers such that a suede tone finish of short pile and high density can be produced.

4,467,506

APPARATUS FOR FORMING AND ADVANCING TRANSVERSE YARN REACHES

Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 307,417, Oct. 1, 1982, Pat. No. 4,397,703.
This application Dec. 6, 1982, Ser. No. 447,042
Int. Cl.³ D04H *3/04*; B32B *5/12*
U.S. Cl. 28—102 **4 Claims**



1. In an apparatus for forming a single fiber into a plurality of transverse-direction reaches and into a plurality of loops connecting said reaches at each end thereof, said reaches and said loops being straddled by a pair of films of indeterminate length for subsequent lamination thereto to form a fiber-reinforced composite film sheet and said apparatus comprising a pair of endless roller chains which are disposed to revolve in a pair of elongated patterns, each said pattern comprising an interweaving section, a diverging section, and a parallel section, wherein each said chain comprises a row of linked rollers

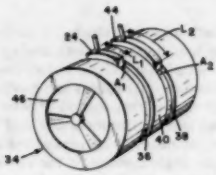
and a row of spindles which are attached to but laterally offset from said row of rollers to project outwardly from said pattern, wherein each of said spindles can rotate about its axis, an improved auxiliary drive means for increasing the rotational speeds of said spindles beyond the rotational speeds imparted by said fiber, said means comprising a drive surface which contacts said spindles at approximately 180° to said reaches in at least said diverging section.

4,467,507

APPARATUS AND METHOD FOR PRODUCING COMMINGLED CONTINUOUS VARIABLE TEXTURE YARN

Hendrikus J. Oswald, Morristown; Russell H. Butler, Rockaway, and Hsin L. Li, Parsippany, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 12, 1982, Ser. No. 357,376
Int. Cl.³ D02G *1/20*
U.S. Cl. 28—257 3 Claims



1. An apparatus for producing variable textured continuous filament yarn, comprising:

a first chamber having sidewalls, a first inlet opening for receiving a first group of filaments, and an outlet for withdrawing said first group of filaments, said first chamber having a finite volume;

a first movable perforated filament-receiving means disposed in said first chamber adjacent to said inlet opening;

a first fluid directing means having an angular disposition relative to said first filament-receiving means for directing a stream of a compressed fluid containing said first group of filaments into contact with said first filament-receiving means to initiate crimping thereof, the angle of disposition ranging from about 15° to 75°;

a second chamber having sidewalls and having an inlet opening for receiving a second group of filaments, said second chamber having a volume at least 50% greater than said first chamber volume and one of said sidewalls of said second chamber being common with one of said sidewalls of the first chamber;

a second movable perforated filament-receiving means disposed in said second chamber adjacent to said second inlet opening and moveable at the same rate as said first filament receiving means;

a second fluid directing means having an angular disposition relative to said second filament-receiving means for injecting a stream of a compressed fluid containing said second group of filaments into contact with said second filament-receiving means to initiate crimping thereof, and to provide a shrinkage of said second group of filaments which differs from the shrinkage of said first group of filaments by at least 30%, the angle of disposition of said second fluid directing means being the same as the angular disposition of said first fluid directing means; and

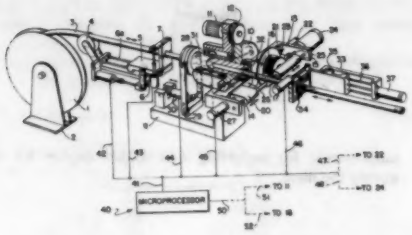
means for commingling said first group of filaments and said second group of filaments to form yarn.

4,467,508

MACHINE FOR CUTTING OF ARMORED OR REINFORCED HOSES

Bengt G. Fjällström, Södra Kungsvägen 9, 52200 Tidaholm, Sweden

Filed Sep. 30, 1982, Ser. No. 431,076
Claims priority, application Sweden, Dec. 30, 1981, 8107876
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—33 T 1 Claim



1. A machine for cutting armored or reinforced hose, particularly a steel armored or reinforced hydraulic hose of the type including outer and inner layers having therebetween an armoring or reinforcing layer, said machine comprising:

a center member mounted for rotation and through which is passed a hose to be cut, said center member having fixed thereto a cog wheel transmission;

a frame fixed to said center member;

means for feeding the hose to be cut into said center member and said frame, said feeding means comprising a holder for holding the hose, a slide supporting said holder, a cylinder for moving said slide, said holder and the hose held by said holder into said center member and said frame to a cutting position, a guide through which passes the hose, and a cylinder for moving said guide toward and away from said center member;

means for cutting through the outer and armor layers of the hose during a cutting operation and comprising a grinding wheel mounted on said frame, a motor for rotating said grinding wheel, and first motor and screw means for moving said grinding wheel along the frame toward and away from the hose;

means for detecting the degree of wear of said grinding wheel and comprising a sensor and second motor and screw means for moving said sensor toward and away from said grinding wheel to sense the relative position of the periphery thereof;

means for cutting through the inner layer of the hose during a cutting operation and comprising a knife fixed to a support device, and a cylinder for moving said support device and said knife along guide rods on said frame toward and away from the hose;

means for rotating said center member and said frame, and thereby said grinding wheel and said knife, about said hose during a cutting operation, said rotating means comprising a cog wheel mounted for meshing engagement with said cog wheel transmission of said center member, and a motor for rotating said cog wheel;

means for holding the hose during the cutting operation and comprising a chuck extending through said center member and held by said guide;

means for removing a cut length of hose from said machine and comprising a gripper for holding the cut length of hose, a holder member supporting said gripper and cylinder means for moving said holder member, said gripper and the cut length of hose held thereby away from the frame; and

microprocessor means operatively connected for controlling automatically the operation of said feeding means, said

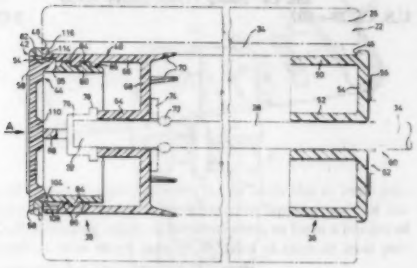
outer and armor layer cutting means, said detecting means, said inner layer cutting means, said rotating means, and said removing means.

4,467,509

PAINT ROLLER

Vittorio Dezen, 5 Riverview Ave., Woodbridge, Ontario, Canada L4L 2X3

Filed Sep. 23, 1982, Ser. No. 422,412
Int. Cl.³ B21B 13/02
U.S. Cl. 29—116 R 10 Claims



1. A paint roller for use with a replaceable paint-applying cover which includes a relatively rigid hollow cylindrical core, the roller comprising: a shaft having an inner end and a free outer end; a roller body rotatably carried on said shaft for fitting within said core and support the cover on the shaft; and handle means coupled to said inner end of the shaft for permitting the roller to be manipulated in use for painting;

said roller body comprising:

an inner end member rotatably mounted on the shaft adjacent its said inner end and located against movement towards said end, said member for fitting within and closing the relevant end portion of the core and defining a first annular end face against which an adjacent end face of the core can be urged to inhibit paint flow into the interior of the core in use; and,

an assembly at said outer end of the shaft for sealing said core against the ingress of paint, said assembly comprising:

an outer end member rotatably located on said shaft adjacent an outer end thereof for fitting closely within an outer end portion of said core while permitting the core to pass thereover when the cover is replaced;

an end cap which is normally coupled to said outer end member but which is removable to permit replacement of the cover, said end cap defining a second annular face for abutment with the relevant annular end face of the core and being axially adjustable with respect to said outer end member to permit the core to be tightly trapped between and sealed against said first and second annular faces; and,

locking means releasable from externally of said end cap and for securing said outer end member and said end cap in relative adjusted axial adjusted positions.

4,467,510

METHOD OF CONDITIONING A ROTARY VALVE SEAT

Takao Kinoshita, and Kazushige Onaka, both of Hyogo, Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

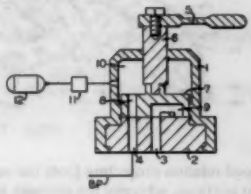
Filed Jan. 8, 1982, Ser. No. 337,919
Int. Cl.³ B21D 53/00
U.S. Cl. 29—157.1 R 3 Claims

1. The method of conditioning the surface of a cast iron rotary valve seat comprising the steps of:

(a) forming a cast iron rotary valve seat from a cast iron in which graphite particles will be separated during subsequent heat treatment through the decomposition of pearlite;

(b) heat treating said rotary valve seat to obtain a hardened surface and increase the concentration of graphite particles on the surface of said rotary valve seat;

(c) lapping said surface of said valve seat at ambient temperature to remove said graphite particles from said surface and thereby form numerous concavities in said valve seat surface; and



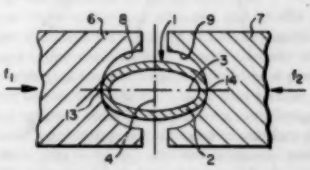
(d) applying lubricant to said valve seat surface whereby said concavities are filled with said lubricant to provide low friction operation of a rotary valve on said seat for an extended duration.

4,467,511

METHOD FOR THE CONFORMATION OF A METALLIC TUBE, PARTICULARLY FOR A HEAT EXCHANGER, AND A HEAT EXCHANGER PROVIDED WITH TUBES THUS CONFORMED

Pierre C. Collgon, 25, rue du Perche, 28400 Nogent le rotrou, France

Filed Jul. 16, 1980, Ser. No. 169,427
Claims priority, application France, Jul. 26, 1979, 79 19357
Int. Cl.³ B21D 53/02
U.S. Cl. 29—157.3 C 12 Claims



1. A method for forming the end of a metallic tube of oblong cross-section to a circular cross-section adapted for use in a vehicular heat exchanger comprising the two steps of:

(a) firstly, radially compressing the end of the tube; and

(b) thereafter, driving a punch into the end of the tube, the punch diameter being equal to that desired for the inner surface of the tube end after forming, being longer than the smallest dimension of the oblong cross-section of the tube and being smaller than the largest dimension of the oblong cross-section of the tube.

4,467,512

EXPANDER TOOL

Edward E. Modes, 1417 Shawnee Trail, Deerfield, Ill. 60015

Filed Feb. 3, 1982, Ser. No. 345,236
Int. Cl.³ B23P 19/04
U.S. Cl. 29—237 12 Claims

1. An expander tool, comprising: a pair of handle members having a pivotal connection therebetween, and a pair of jaw members operatively connected to said handle members for spreading said jaw members when said handle members are moved toward each other, said jaw members being channel-

shaped with thin flat bight portions for engaging a workpiece with the thin flat bight portions in generally parallel confronting relation and with generally parallel leg portions, said channel-shaped jaw members being nested with said leg portions in

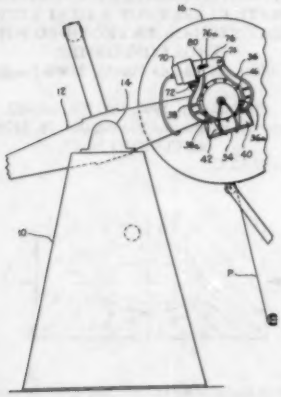
overlapped relation projecting from the same sides of the thin flat bight portions, whereby the opposite side of thin flat bight portion of one of said jaw members can be positioned in close proximity to a workpiece.

4,467,513

DRUM BRAKE CONVERSION METHOD AND APPARATUS FOR A TURRET UNWINDING STAND

David M. Cline, 312 Hunting Hollow Rd., Greenville, S.C. 29615

Filed Jun. 30, 1982, Ser. No. 393,636
Int. Cl.³ B23P *7/00*
U.S. Cl. 29—401.1 **3 Claims**



1. A method of converting a brake on a turret arm of an unwinding stand on which paper and the like is unwound from a disc brake unit to a drum brake unit, said turret unwinding stand being of the type having at least one turret arm on each side of said stand between which a shaft of a roll of paper or the like is rotatably carried, said turret arm having a journal opening through which one end of said shaft extends for making connection with said brake, a mounting plate carried on said turret arm through which said one end of said shaft extends and to which said disc brake unit is mounted, said turret arm being rotatably carried for rotational movement relative to said unwinding stand, said method comprising:

providing an adapter bracket for adapting said turret arm to accommodate said drum brake when said disc brake is removed from said disc brake mounting plate for convention;

attaching said adapter bracket means to said disc brake mounting plate on said turret arm;

providing a brake drum adapted for connection to said one end of said shaft;

pivotably supporting brake shoe means on said adapter bracket for engaging said brake drum;

and

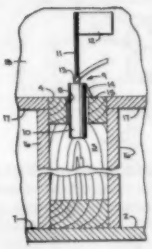
providing means for adjustably urging said brake shoe means against said brake drum.

4,467,514

LOCATING ARRANGEMENT FOR BUILDING WIRING INSTALLATION

Charles Dahlke, 1505 N. Franklin Pl., Apt. 201, Milwaukee, Wis. 53202

Filed Nov. 24, 1982, Ser. No. 444,432
Int. Cl.³ B23Q *17/00;* **B65H** *59/00*
U.S. Cl. 29—407 **3 Claims**



1. The method of installing electrical wiring in a building under construction wherein the building provides areas having a floor and an open framework including spaced vertical studs with connecting horizontal top plates, comprising the steps of:

(a) marking the floor with a mark disposed generally vertically below where an outlet box or the like is to ultimately be positioned and between a pair of studs,

(b) forming a hole in a top plate substantially vertically above said mark,

(c) providing a locator tool having an indicator portion and hanging said tool from said top plate and within said hole so that said indicator portion extends above said top plate,

(d) then enclosing said framework with wall and ceiling panels with the latter forming a crawlspace thereabove,

(e) locating the indicator portion of said tool in said crawlspace and connecting an electric wire to said tool,

(f) releasing said tool from said top plate so that the tool and connected wire drop generally vertically downwardly by gravity through said hole and toward said mark,

(g) cutting an opening in a said wall panel at a desired height and generally directly above said floor mark to expose said dropped wire and retrieving said wire therethrough,

(h) and finally connecting said wire to an outlet box or the like for installation at said opening.

4,467,515

METHOD OF FINISHING ALUMINUM SHEETS

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Filed Feb. 4, 1982, Ser. No. 345,750
Int. Cl.³ B21B *1/46*
U.S. Cl. 29—527.2 **5 Claims**

1. A method of finishing a rectangular sheet of bright aluminum to provide an at least partially painted central rectangular area surrounded on all four sides by a brushed satin border with the border on the ends on the painted rectangular area extending to the edges of the aluminum sheet, including the steps of:

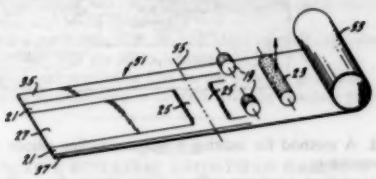
moving a continuous strip of aluminum having a width equal to the desired width of the finished sheet past a pair of laterally spaced brushes,

applying the brushes continuously to the moving strip of aluminum to form a pair of narrow bands of brushed

surface extending the entire length of the strip with the narrow bands being located inwardly of the longitudinal edges of the strip,

brushing the strip intermittently to provide brushed areas between the narrow bands of brushed surface with the brushed areas being of predetermined length and spaced predetermined distances,

applying at least partially painted rectangular areas to the surface of the strip with each at least partially painted rectangular area being located between and overlapping the brushed narrow bands and extending between adja-



cent brushed areas between bands with the at least partially painted rectangular areas overlapping but not entirely covering adjacent brushed areas to form a border of brushed satin finish around all sides of each at least partially painted rectangular area, and

cutting the strips with laterally extending cuts across the intermittently spaced brushed areas and between at least partially painted rectangular areas to provide rectangular sheets having at least partially painted rectangular central areas with a brushed satin border at the smaller ends of the sheet extending to the edges of the sheet.

4,467,516

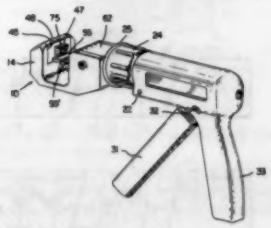
WIRE INSERTION APPARATUS

Waldemar John, High Point, and John J. Tucci, Winston-Salem, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 8, 1982, Ser. No. 440,101

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—566.4 **5 Claims**



1. Apparatus for inserting wires into terminals mounted on opposite sides of an electrical connector comprising a connector holder including an anvil, wire insertion ram having a first wire insertion head mounted on one side of the anvil for reciprocation towards and away from a connector when in the connector holder to insert a wire into a terminal on one side of the connector adjacent the wire insertion ram, means being provided to effect reciprocation of the insertion ram, the improvement comprising a second wire insertion head mounted on the other side of the anvil aligned with the first wire insertion head, the connector holder including a connector supporting slide mounted on the anvil between both wire insertion heads for reciprocal sliding movement towards and away from the second wire insertion head during corresponding movement of the wire insertion ram, a linkage between the slide and the insertion ram enabling return movement of the insertion ram away from the second wire insertion head to effect corresponding movement of the slide.

4,467,517

TOOL CHANGER FOR FACING HEAD

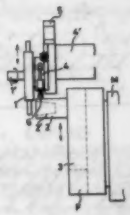
Takeshi Kurata, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 2, 1982, Ser. No. 364,891

Claims priority, application Japan, Apr. 13, 1981, 56-52934[U]; Oct. 29, 1981, 56-173430

Int. Cl.³ B23B *3/26*; B23Q *3/157*

U.S. Cl. 29—568 **2 Claims**



1. A machine tool and changer combination, comprising:

a spindle head having a longitudinal axis;

a face plate connected to said spindle head, having a diameter extending at right angles to said longitudinal axis and rotatable about said longitudinal axis;

a tool slide slidably mounted on said face plate along said diameter and fixable at anyone of a plurality of radial positions on said face plate;

a tool block connected to said tool slide and movable therewith to said plurality of radial positions;

a changer support disposed adjacent said spindle head;

a changer slide slidably mounted in a linear direction on said changer support and parallel to said diameter of said face plate with said plate in a selected rotational position with respect to said longitudinal axis of said spindle head;

a sensing member slidably mounted on said changer slide in a direction parallel to said diameter of said face plate when said face plate is in said selected rotational position, said sensing member being movable by sliding movement of said changer slide, in a path which intersects said tool block with said face plate in said selected rotational position;

biasing means engaged with said sensing member for biasing said sensing member toward said tool block with said face plate in said selected rotational position;

a changer arm rotatably mounted to said changer slide and movable into a changing position for changing a tool of said tool block;

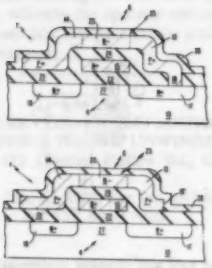
drive means connected to said changer slide for driving said changer slide to move said sensing member into engagement with said tool block with said face plate in said selected rotational position and to move said arm into said changing position; and

a sensor connected to said changer block and engageable by said sensing member with movement of said sensing member due to an abutment of said sensing member with said tool block at any of said plurality of radial positions upon movement of said changer slide, said sensor connected to said drive means for stopping said drive means when said changer slide brings said changer arm into changing position.

4,467,518
PROCESS FOR FABRICATION OF STACKED, COMPLEMENTARY MOS FIELD EFFECT TRANSISTOR CIRCUITS

Jai P. Bansal, Manassas, Va.; Claude L. Bertin, S. Burlington, and Ronald R. Troutman, Essex Junction, both of Vt., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 265,001, May 19, 1981,. This application Feb. 7, 1983, Ser. No. 464,235
Int. Cl.³ H01L *21/265, 21/225*
U.S. Cl. 29—571 8 Claims



8. A method for fabricating stacked complementary metal oxide silicon field effect transistor device comprising the steps of:

depositing a layer of phosphosilicate glass on top of the gate electrode fo an N channel field effect transistor device formed in the surface of a monocrystalline silicon substrate;

depositing a layer of P-type polycrystalline silicon over said phosphosilicate glass layer and extending over and physically contacting the drain diffusion on the surface of said monocrystalline silicon substrate of said N channel FET device;

heating said polycrystalline silicon layer including the portion contacting said drain region of said N channel device, to a recrystallization temperature and heating said phosphosilicate glass layer as to diffuse phosphorus atoms from said first phosphosilicate glass layer upwardly into said silicon layer, forming an N-type region which is juxtaposed with said gate electrode and self-aligned to said gate electrode;

cooling and recrystallizing said polycrystalline silicon layer into a monocrystalline silicon form having a lattice orientation epitaxially reoriented to the lattice orientation of said monocrystalline semiconductor substrate; and

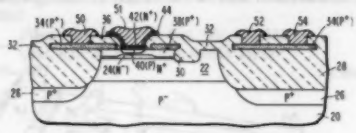
selectively etching the portion of said silicon layer in said drain region of said N channel device to selectively sever the electrical connection therewith;

whereby an upper, P channel field effect transistor device is formed in said silicon layer, which shares said gate electrode with said N channel device and whose drain selectively makes electrical contact with said drain of said N channel device selectively forming a complementary metal oxide silicon inverter.

4,467,519
PROCESS FOR FABRICATING POLYCRYSTALLINE SILICON FILM RESISTORS

Reinhard Glang, Somers; San-Mei Ku, Poughkeepsie, both of N.Y., and Alfred Schmitt, Boeblingen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1982, Ser. No. 384,371
Int. Cl.³ H01L *21/263, 21/26, 21/425*
U.S. Cl. 29—576 B 17 Claims



1. A method for making a polycrystalline silicon resistor comprising:

depositing a polycrystalline silicon layer of very fine grain size upon an insulator surface;

ion. implanting boron into said polycrystalline silicon layer approximately equal to or in excess of the solid solubility limit of said polycrystalline silicon at between about 3×10^{19} and 3×10^{20} atoms/cm^3;

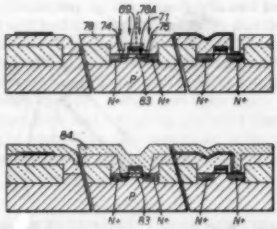
thermally annealing the said polycrystalline silicon layer at a temperature of less than about 1100° C. to control the grain size of the said polycrystalline silicon layer resistor to be between about a few nanometers and 300 nanometers;

and making contacts to said layer as said resistor.

4,467,520
METHOD OF MANUFACTURING MASK TYPE READ ONLY MEMORY

Yoshihisa Shiotari, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 17, 1982, Ser. No. 408,873
Claims priority, application Japan, Aug. 17, 1981, 56-128450
Int. Cl.³ H01L *21/265, 21/22*
U.S. Cl. 29—576 B 3 Claims



1. A method of manufacturing a mask type Read Only Memory, comprising the following steps in the following order:

selectively forming a first insulating layer having a thick portion and a thin portion for a field region and a gate insulating layer, respectively, on a semiconductor substrate of a first conductivity type;

forming a polysilicon layer on said insulating layer;

forming gate electrodes of first and second MOS transistors by partially removing said polysilicon layer;

forming second conductivity type regions to be source and drain regions of said MOS transistors in said semiconductor substrate;

forming a second insulating film on said semiconductor substrate, in which the MOS transistors are formed by the

source and drain regions and channel regions therebetween, said channel regions having said gate electrodes formed thereover;

forming a contact hole in the second insulating film on the second conductivity type region of said second MOS transistor for allowing the formation of an outer electrode;

forming the outer electrodes in said contact hole and forming bonding pads on said second insulating film;

selectively removing said second insulating film and exposing the gate electrode and parts of source and drain regions of said first MOS transistor;

implanting ions of said second conductivity type to the channel region and said parts of source and drain regions of said first MOS transistor;

forming a protective film on said bonding pads, the outer electrodes, and the MOS transistors;

removing said protective film on the bonding pad; and

providing an outer-lead in contact with the bonding pad.

4,467,521

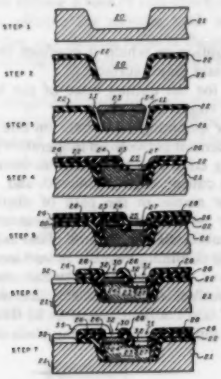
SELECTIVE EPITAXIAL GROWTH OF GALLIUM ARSENIDE WITH SELECTIVE ORIENTATION

Frank H. Spooner, Concord; Charles R. Snider, Southboro, and John L. Heaton, Bedford, all of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,506

Int. Cl.³ H01L *21/20, 21/302, 21/76*

U.S. Cl. 29—576 E **15 Claims**



1. A method for fabricating semiconductor devices on semi-insulating substrates, comprising:

selectively removing a portion of said semi-insulating substrates creating thereby wells in said substrate,

disposing a first dielectric layer over said semi-insulating substrate and said wells,

removing selected areas of said first dielectric thereby exposing areas of said substrate underlying said wells, said exposed areas of said substrate having a single crystallographic orientation,

disposing a heavily doped contact layer upon said exposed areas of said substrate having a single crystallographic orientation,

disposing a moderately doped active layer on said contact layer,

selectively removing a first region of said active layer and a portion of said contact layer underlying said first region,

disposing a second dielectric layer over said active layer and said contact layer underlying said first region,

selectively removing an area of said second dielectric in said first region exposing thereby said contact layer,

metallizing said contact layer underlying said first region to form an ohmic contact,

disposing a third dielectric layer over said second dielectric layer and said metallized ohmic contact,

selectively removing said first, second, and third dielectric layers overlying said moderately doped layer,

selectively removing said second and third dielectric layers overlying said moderately doped layer,

selectively removing said third dielectric layer overlying said metallized ohmic contact,

metallizing a selected region of said substrate underlying said removed first, second and third dielectric layers,

metallizing a selected region of said moderately doped layer underlying said removed second and third dielectric layers,

metallizing a selected region of said ohmic contact underlying said removed third dielectric layer, and

selectively disposing a second metallized region overlying said selectively metallized moderately doped layer and said selectively metallized substrate.

4,467,522

PROCESS FOR MANUFACTURING PLASTIC CONTAINERS INCORPORATING A HEAT DISPERSER FOR INTEGRATED CIRCUITS

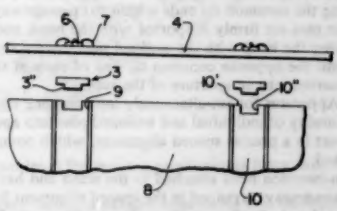
Giuseppe Marchisi, Via A. Pecorini, 8, 20100-Milano, Italy

Filed Apr. 12, 1982, Ser. No. 367,602

Claims priority, application Italy, Apr. 11, 1981, 21117 A/81

Int. Cl.³ H05K *3/32*

U.S. Cl. 29—827 **1 Claim**



1. Process for manufacturing plastic containers incorporating a heat disperser for integrated circuits, consisting in;

working a sheet metal strip so as to form a series of identical flat aligned structures, each comprising a central support area and a number of flat conductors;

welding to each support area a chip of semiconductor material comprising an integrated circuit;

electrically connecting predetermined areas in each integrated circuit to predetermined conductors;

joining to each structure in the sheet metal structure a metal mass, acting as a heat disperser, so that it will adhere to the sheet metal surface opposite to the support area;

placing the sheet metal strip and the heat dispersers in an appropriate die with the dispersers facing the extractors in the die;

injecting into the die under pressure synthetic resin in liquid form;

letting the resin coagulate;

opening the die and

operating the extractors,

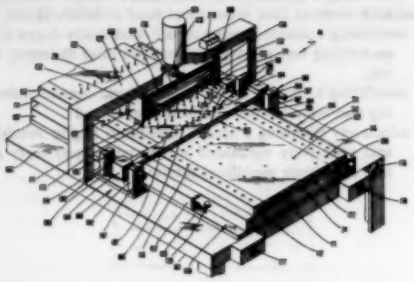
characterized in that the coupling of the heat dispersers to the structures in the sheet metal strip consists in placing a disperser on each outlet hole of the extractors, so as to close it completely, and in placing the prepared sheet metal strip in the die with its free surfaces opposite the support areas in contact with the dispersers.

4,467,523

METHODS OF AND APPARATUS FOR INSERTING PINS INTO A SUBSTRATE

William M. Chisholm, Midlothian, Va., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 326,102
Int. Cl.³ H05K *3/00*; B23P *23/00*
U.S. Cl. 29—845 **27 Claims**



1. A method of simultaneously inserting one end of each of a plurality of individual and unlinked pins into apertures of a support in a precise spaced alignment, which comprises the steps of:

inserting into fixed passageways of a head freely extending common tip ends of the pins, the passageways being spaced in the precise alignment;

wedging into the fixed passageways of the head the freely extending common tip ends of the pins by laterally offsetting the common tip ends within the passageways so that the pins are firmly supported with the head; and

moving the head with the wedged pins toward the support until the opposite common tip end of each of the pins is inserted into an aperture of the support.

16. Apparatus for simultaneously inserting one end of each of a plurality of individual and unlinked pins into apertures of a support in a precise spaced alignment, which comprises:

a stand;

a pin-insertion head attached to the stand and having fixed passageways arranged in the spaced alignment for receiving therein freely extending common tip ends of the pins;

means formed on the pin-insertion head for laterally offsetting the freely extending common tip ends of the pins in the fixed passageways of the head to wedge the pins within the head; and

means mounted on the stand for moving the head with the wedged pins toward the support until the opposite tip end of each of the pins is inserted into an aperture of the support.

4,467,524

CORRUGATED CARTON CUTTER

Stanley Ruff, 9 Arbor Dr., New York, N.Y. 10804; Alphonse F. Wolter, Wheatley Heights, N.Y., and Arthur Torrence, Newtown, Conn., assignors to Stanley Ruff, New Rochelle, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,496
Int. Cl.³ B26B *3/08*
U.S. Cl. 30—2 **29 Claims**

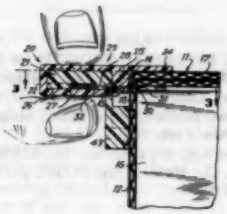
1. An arrangement for holding a cutting blade having at least one cutting edge, particularly for use as a utility knife for opening filled boxes, especially of corrugated board, by cutting along the edge region of a box which is formed by two adjacent box surfaces, comprising:

(a) a holding member having a major surface and an edge delimiting the same;

(b) means for holding the blade on said major surface in at least one position in which the cutting edge of the blade is at least partially situated beyond said delimiting edge of said holding member, with freedom of movement relative to the latter only in one direction substantially normal to said major surface;

(c) a confining member having a contact surface substantially normal to said major surface of said holding member and operative to contact one of the adjacent surfaces of the box next to the cutting blade during the cutting operation, and a distancing surface substantially parallel to and spaced a predetermined distance from the cutting blade and extending beyond said contact surface to engage the other of the adjacent surfaces of the box during the cutting operation and thus to keep the cutting blade at said predetermined distance from the other adjacent surface;

(d) means for guiding said confining member on said holding member for movement relative thereto between a first position in which it does not interfere with the movement of the blade in and opposite to said one direction and a



second position in which it confines the blade between itself and said major surface;

(e) a cover for the cutting edge of the blade, said cover having an engagement surface;

(f) means for mounting said cover on one of said members for displacement between an inoperative position in which the cutting edge is exposed and an operative position in which the cutting edge is covered; and

(g) abutment means in the path of displacement of said cover, for positioning said engagement surface of said cover in substantially the same plane as said contact surface of said confining member in said inoperative position of said cover, said engagement surface contacting said one adjacent surface of the box together with said contact surface of said confining member to thereby provide for additional guidance of the cutting blade during the cutting operation.

4,467,525

AUTOMATED SIGN GENERATOR

David J. Logan, Glastonbury, and Daniel J. Sullivan, Hartford, both of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Filed Jul. 26, 1982, Ser. No. 401,722
Int. Cl.³ B43I *11/00*
U.S. Cl. 33—18 B **26 Claims**

1. Apparatus for plotting and cutting large scale text in sheet materials for signs and the like comprising:

movable support means for moving the sheet material back and forth in one coordinate direction during plotting and cutting operations including a rotatable feed roller having an axis of rotation and a work-engaging surface circumscribing the roller axis and against which the sheet material rests as plotting or cutting operations are carried out;

a tool carriage supported adjacent the rotatable feed roller and movable relative to the roller in a second coordinate direction parallel to the roller axis;

interchangeable cutting and plotting tools;

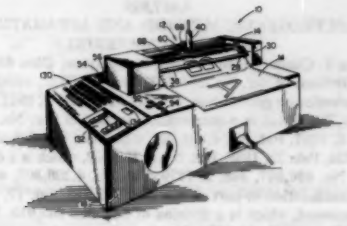
a tool support movable on the tool carriage between an elevated and lowered position relative to the feed roller and having a tool mount accepting the interchangeable cutting and plotting tools one at a time for movement with

the support between the elevated and lowered positions and into and out of working engagement with the sheet material on the roller;

a lift motor mounted on the tool carriage and connected to the support for moving the support and the tool between the elevated and lowered positions;

drive motor means connected with the tool carriage and the support means for moving the tool and the sheet material on the feed roller relative to one another;

control means connected with the drive motor means and the lift motor for controlling the tool and sheet material



movements during cutting and plotting operations; and including

memory means for storing a font of text characters in terms of tool strokes suitable for moving both of the interchangeable cutting and plotting tools in the tool mount to trace on the material the profiles of each character in a sign text; and

text entry means coupled with the memory means for selecting text characters in the font of the memory means and composing a desired sign text to be traced by any one of the interchangeable tools.

4,467,526

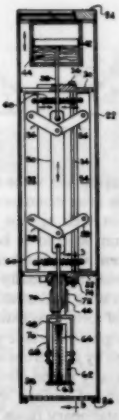
INCLINATION INSTRUMENT

Hubert J. Otte, Toronto, Canada, assignor to Techdel International Inc., Toronto, Canada

Filed Jun. 16, 1982, Ser. No. 388,965

Int. Cl.³ E21B *47/022*; G01C *9/14*

U.S. Cl. 33—304 **11 Claims**



1. Inclination measurement apparatus for insertion in and removal from a remote location and comprising;

housing means having a longitudinal axis and a transverse axis;

reference pendulum means mounted for swinging about said longitudinal axis of said housing means to respond to deviation of said housing means about such axis;

inclination indicator means responsive to the inclination of such housing means about such transverse axis, and connected to such reference pendulum means, whereby to adopt a predetermined reference position relative to such longitudinal axis;

movable locking means operable to restrain movement of such indicator means about such transverse axis and being releaseable to permit such movement, and,

movement means connected to said locking means and responsive to rotation of said housing at a predetermined speed, to move said locking means away from said inclination indicator means, and, upon cessation of such rotation, said movement means being operable to move said locking means back into locking engagement with said indicator means.

4,467,527

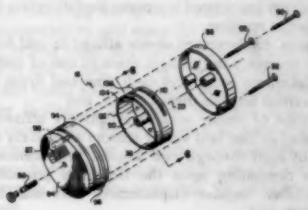
DIGITAL HEAD-OUT LEVEL

Larry North, 8577 Six Shooter Cir., and Bryant R. Gold, 10191 Dimple Dell Rd., both of Sandy, Utah 84092

Filed Feb. 11, 1982, Ser. No. 347,861

Int. Cl.³ G01C *9/06*

U.S. Cl. 33—366 **2 Claims**



1. A digital level for use in a gravitational force field comprising:

a main body having a straight edge along one side thereof;

signal means rotatably mounted to said main body for generating at least one electrical signal that indicates the angle of inclination of a reference plane associated with said signal means relative to a level plane, said level plane being orthogonal to the gravity forces of said gravitational force filed, said signal means being mounted to said main body such that said reference plane is parallel to said straight edge, said signal means further comprising:

a rotating cylindrical member axially mounted on a central shaft secured to said main body, said rotating member being adapted to freely rotate about a central axis defined by said shaft;

a weight attached to said rotating member, said weight being adapted for rotation to a lowest point by gravity forces, thereby causing said rotating member to rotate to a fixed reference position with respect to said level plane, said fixed reference position of said rotating member serving to define said reference plane;

optical tracking means for tracking the rotation of said rotating member and generating said electrical signal, said electrical signal indicating the angular rotation through which said rotating member has rotated from said reference position;

register means responsive to said electrical signal for displaying the angle of inclination of said straight edge relative to said level plane; and

power supply means mounted within said main body for powering said signal means and register means, wherein

said rotating member comprises a cylindrical drum, said drum having a diameter that is greater than its length, and said drum being adapted to rotate about the central axis passing through the center of its ends, and wherein said tracking means comprises

a stationary light source adapted to shine a light against the inside wall of said cylindrical drum;

a plurality of apertures selectively placed around the wall of said cylindrical drum, including;

a reference position aperature,

a set of angular displacement aperatures, each aperature of said set being equiangularly spaced around the wall of said cylindrical drum, and

a direction aperature, comprising a continuous slit that begins at said reference position aperature and traverses at least one quarter of the distance around the circumference of said drum;

a housing structure inside of which said cylindrical drum is rotatably mounted;

a plurality of light sensors selectively affixed to said housing structure, each of said light sensors being adapted to receive a ray of light from said light source that has passed through one of said aperatures, and to generate a tracking signal when said light ray is received, including;

a reference position sensor affixed to said housing so as to receive a ray of light through said reference so as to receive a ray of light through said reference position aperature only when said drum has rotated to its fixed reference position,

a direction sensor affixed to said housing so as to receive a ray of light through said direction aperature whenever said drum has rotated in a prescribed direction form said reference position,

an angular displacement sensor affixed to said housing so as to receive a ray of light through one of said angular displacement aperatures each time said drum rotates a prescribed angular displacement, and

a plurality of venier sensors selectively affixed to said housing so that said venier sensors selectively receive a ray of light through said angular displacement aperatures depending upon the fractional portion of said prescribed angular displacement that said drum has rotated; and

counting and logic circuitry for promoting the tracking signals received from each of said plurality of sensors and keeping track of the angular displacement of said drum with respect to said reference position, and for further providing said electrical signal to said digital display means.

4,467,528

PARALLEL RULER

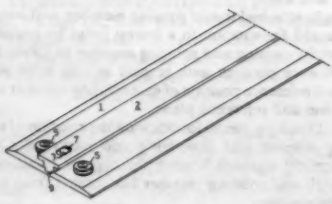
Lars C. Hensbo, Vejlands Alle 139, Copenhagen, Denmark

Filed Feb. 4, 1982, Ser. No. 345,695

Claims priority, application Denmark, Feb. 9, 1981, 541/81

Int. Cl.³ B43L *5/00*

U.S. Cl. 33—444 **4 Claims**



1. In a parallel ruler of the type including a flexible longitudinally extending ruler body having opposing parallel longitudinal edges and a flexible, longitudinally coextensive finger rail slidably engageable with said ruler body, the improvement comprising retaining means for retaining the ruler body in a bowed configuration after flexion thereof to impart radial stress to said ruler body, said retaining means including clamping means integrally associated with each end of the ruler for clamping said finger rail to said ruler body in adjustable longitudinal relationship to retain said ruler body in the desired degree of curvature, wherein the clamping means at one end of the ruler comprises an element that is longitudinally adjustable, and the clamping means at the other end of the ruler does not comprise such longitudinally adjustable element.

4,467,529

ELECTROSTATIC METHOD AND APPARATUS FOR TREATING MATERIAL

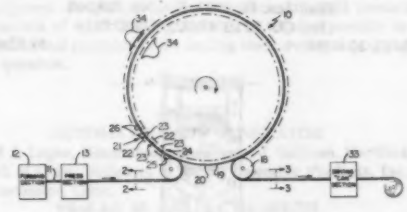
James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Division of Ser. No. 386,703, Jun. 9, 1982, , which is a continuation-in-part of Ser. No. 319,114, Nov. 9, 1981, Pat. No. 4,404,754, which is a continuation-in-part of Ser. No. 261,784, May 8, 1981, Pat. No. 4,338,729, which is a division of Ser. No. 124,224, Feb. 25, 1980, Pat. No. 4,283,862, which is a division of Ser. No. 050,807, Jun. 2, 1979, Pat. No. 4,208,807, which is a continuation-in-part of Ser. No. 925,378, Jul. 17, 1978, abandoned, which is a division of Ser. No. 863,910, Dec. 23, 1977, Pat. No. 4,111,773, which is a continuation-in-part of Ser. No. 695,068, Jun. 11, 1976, Pat. No. 4,033,841, which is a continuation-in-part of Ser. No. 569,815, Apr. 21, 1975, Pat. No. 3,966,575, which is a continuation-in-part of Ser. No. 499,178, Aug. 21, 1974, Pat. No. 3,893,898, which is a continuation-in-part of Ser. No. 383,255, Jul. 27, 1973, Pat. No. 3,849,275, which is a division of Ser. No. 263,605, Jun. 16, 1972, Pat. No. 3,795,605, which is a continuation-in-part of Ser. No. 53,402, Jul. 9, 1970, abandoned, said Ser. No. 263,605, is a continuation-in-part of Ser. No. 25,938, Apr. 6, 1970, Pat. No. 3,687,834, which is a continuation-in-part of Ser. No. 864,851, Oct. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 811,421, Mar. 28, 1969, abandoned. This application Sep. 24, 1982, Ser. No. 422,597

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.³ F27B *3/34*; B01D *17/06*

U.S. Cl. 34—1 **10 Claims**



1. In a method for drying wet webs and comprising the steps of providing a rotatable drier drum having a peripheral surface means, engaging a wet web against said peripheral surface means of said drier drum so as to be heated thereby, disposing electrical means adjacent said peripheral surface means, creating at least two adjacent substantially constant and non-oscillating stationary fields with said electrical means so that said fields have field lines of force that extend between said electrical means and said peripheral surface means for enhancing the heating of said wet web by said drum and so that said fields are serially arranged generally in the circumferential direction of rotation of said peripheral surface means, and rotating said drum relative to said stationary fields while said fields remain substantially constant and non-oscillating, the improvement wherein said step of creating at least said two fields comprises the step of creating at least said two fields so as to have the

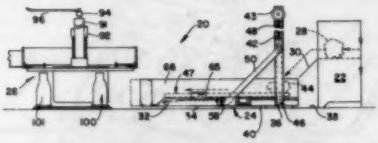
respective field lines of force thereof acting in substantially opposite directions.

4,467,530

METHOD AND APPARATUS FOR BATCH CONTINUOUS LAUNDRY PROCESSING

Robert H. Fesmire, Barrington Hills, and Warren T. Hansen, Glenview, both of Ill., assignors to Ellis Corporation, Chicago, Ill.

Filed Jun. 4, 1982, Ser. No. 384,928
Int. Cl.³ F26B *5/08, 11/08*
U.S. Cl. 34—8 **55 Claims**



1. A method for batch continuous extraction comprising the steps of:

continuously conveying a plurality of discrete laundry batches from a washing machine to a segmented, rotatable centrifugal extractor having a plurality of compartments;

aligning one of the laundry batches with one of said compartments;

continuously loading one of said batches of laundry automatically into each of the compartments of the segmented, rotatable centrifugal extraction drum;

rotating said drum for a period of time sufficient to remove the fluid from said laundry batches; and

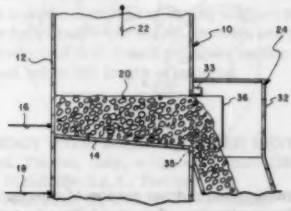
automatically expelling said laundry from each of said laundry compartments after said period of rotation is completed.

4,467,531

METHOD AND APPARATUS FOR CONTROLLING THE DISCHARGE OF PARTICULATE SOLIDS FROM AN EXPANDED BED OF SUCH SOLIDS

James L. Skinner, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 12, 1982, Ser. No. 367,201
Int. Cl.³ F26B *3/16, 17/14*
U.S. Cl. 34—10 **7 Claims**



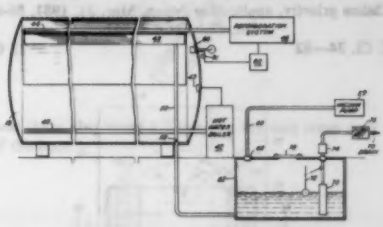
1. In a method for drying particulate coal solids by charging said solids to a solids drying zone; supporting said solids above a grate means in said drying zone, said grate being adapted to the flow of a gas upwardly through said grate and said solids; passing a gas upwardly through said grate and said solids to maintain said solids in an expanded bed above said grate and recovering dried solids from said expanded bed through a discharge opening, the improvement comprising positioning a plurality of vertical door means across said discharge opening, said doors being adapted to open about a vertical axis and controlling the discharge of said solids from said expanded bed by opening and closing said doors at a rate sufficient to maintain said expanded bed at a depth no greater than the height of said discharge opening so that said solids are uniformly discharged from all depths of said expanded bed.

4,467,532

APPARATUS AND PROCESS FOR DRYING LUMBER

Harry W. Drake, R.R. #1, Box 253, Marshall, Ill. 62441

Filed Jan. 6, 1983, Ser. No. 456,266
Int. Cl.³ F26B *5/04, 13/30*
U.S. Cl. 34—16.5 **20 Claims**



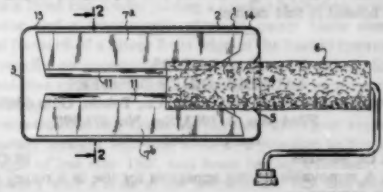
1. A lumber drying apparatus for drying lumber which has been cut into any of a number of various board sizes, comprising a structure defining a sealable vessel having an opening for receiving a quantity of green lumber to be dried, a sealable door mounted on said vessel for closing and sealing the opening in said vessel, a sump connected to the lower part of the vessel for collecting the moisture extracted from said lumber, means connected to said sump for creating and maintaining a vacuum in said sump and thereby creating and maintaining a vacuum in said vessel, heating means for raising the temperature in said vessel and maintaining the temperature at a desired level for facilitating emmission of vapor from the lumber, refrigeration means for condensing said emitted vapor to a liquid phase, means for collecting and directing said liquid to said sump thereby keeping said liquid away from said lumber, and pumping means for removing the collected liquid from said sump.

4,467,533

DEVICE FOR REMOVING LIQUID FROM A PAINTING ROLLER

Michel Sica, 53 Ave. du Consul Général, Nordling, 93190 Livry Gargan, France

Filed Feb. 27, 1981, Ser. No. 238,841
Claims priority, application France, Mar. 4, 1980, 80 04776
Int. Cl.³ F26B *17/30*; B08B *3/00*
U.S. Cl. 34—58 **13 Claims**



1. A device for removing liquid from a painting roller comprising a tubular container having a tubular wall, a closed end and defining at an end opposed to said closed end an opening for inserting said roller in the container, internal spacer elements attached to and inwardly extending from the tubular wall and oppositely disposed in spaced relation to each other for receiving in the space between opposite spacer elements said roller in a position of the roller spaced from the tubular wall and for gripping the roller and drivingly connecting the

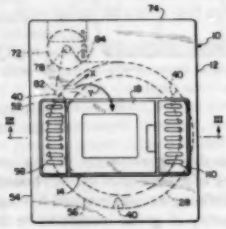
container to the roller, and an outer cylindrical rolling surface carried by the tubular wall whereby the liquid can be removed from the roller under the effect of centrifugal force by rolling the rolling surface of the container containing the roller along a surface.

4,467,534

DRYING APPARATUS

Kazuyoshi Murase, Nagoya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 4, 1982, Ser. No. 354,532
Claims priority, application Japan, Mar. 31, 1981, 56-48812
Int. Cl.³ F26B *11/02*
U.S. Cl. 34—82 **15 Claims**



1. A drying apparatus, comprising:
a cabinet having a front panel and side walls;
a drum having one open end and one closed end and having a horizontal axis disposed in said cabinet, said closed end having through holes;
support means for rotatably supporting said drum inside said cabinet;
an opening disposed in said front panel and facing said open end of said drum for loading and unloading said drum;
a door operable for opening and closing said opening;
an air inlet port having an induction opening provided in a portion of said cabinet;
an exhaust port having an exhaust opening provided on one side of said door on said front panel, said exhaust port being positioned in alignment with at least a portion of said open end said exhaust port also being off center relative to said drum and communicating with the interior of said drum directly through said open end such that an air flow path is defined from said air inlet port to said exhaust port through said through holes and said drum open end;
drive means, including a motor, for rotating said drum in the direction in which the lower portion of said drum moves away from said exhaust port; and
means for supplying heated air into the interior of said drum housed in said cabinet.

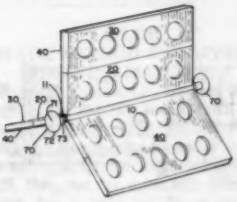
4,467,535

LAUNDRY DRIER DIVIDERS

Dorothy A. Hardison, 1015 Alden Ct., Toledo, Ohio 43609

Filed Mar. 4, 1983, Ser. No. 471,990
Int. Cl.³ F26B *11/02*
U.S. Cl. 34—109 **10 Claims**

1. A removable drying apparatus for use in a rotary drum dryer comprising:
a rotatable core unit, said core unit having a cylindrical opening extending lengthwise through the center of said core unit;
a plurality of perforated lower fin dividers integral with and extending outwardly from said core unit;
a perforated upper fin divider foldably connected to each of said lower fin dividers;
a centering rod disposed within said cylindrical opening of said core unit around which said core unit will rotate, said centering rod being provided with a threaded opening in the center of each end portion of said tubular centering rod;
a pair of suction cup pieces, each consisting of a flexible suction cup face portion and a suction cup base portion integral with and opposite of said suction cup face portion, and said suction cup base portion being provided with a cylindrical opening extending part way into the center of said suction cup base portion perpendicular to the plane of said flexible suction cup face outer periphery;



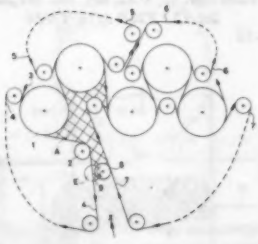
a pair of adjusting connecting bolts, each threaded on one end portion and substantially smooth on its other end portion to connect each of said suction cup pieces one to each end of said centering piece; the threaded end portion being provided for adjustably screwing into each of the said threaded openings on said center rod, and the smooth end portion for slidably fitting snuggly into the said cylindrical opening in said suction cup base portion.

4,467,536

CANVAS ROLL ARRANGEMENT

Haruyoshi Fujiwara, and Yuji Kadota, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 250,872, Apr. 3, 1981, abandoned. This application Apr. 7, 1983, Ser. No. 482,917
Claims priority, application Japan, Apr. 10, 1980, 55-48721
Int. Cl.³ F26B *13/08*
U.S. Cl. 34—116 **3 Claims**



1. In a multi-cylinder dryer section of a paper making machine having a plurality of carrier belts adapted to press a paper web against at least one drying cylinder, at least one pair of said carrier belts is entrained to move in opposition to each other and define a space through which air drafts may pass, an arrangement for minimizing the passage of air drafts through said space comprising a roller disposed between said belts in contact with one of said belts to be driven thereby, said roller being spaced from the other belt and having a diameter that substantially occludes the width of said space but leaves a defined clearance between confronting portions of said other belt and the periphery of said roller, said roller and said other belt being driven in a direction coacting to produce a flow of air contrary to the direction of air draft flow to seal said de-

fined clearance and impede the passage of air drafts through said space.

4,467,537

EQUIPMENT FOR HEAT-TREATING FLAT, BAND-LIKE LENGTHS OF MATERIAL

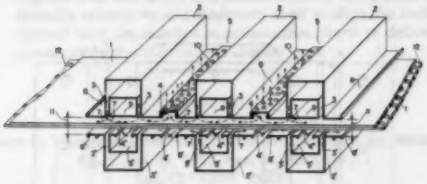
Gerhard Trötscher, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH., Fed. Rep. of Germany

Filed Aug. 25, 1980, Ser. No. 180,582

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935373

Int. Cl.³ F26B *13/02*

U.S. Cl. 34—155 **12 Claims**



1. In heat-treating equipment for flat, band-like lengths of materials supported on a gas-permeable perforated conveyor means, using a gaseous flowing drying medium, said equipment being composed of a thermally insulated housing with transmission slots at both ends for a length of material, nozzle conduits arranged in sequential spacing above and below the length of material and directed transversely to the direction of motion of said material and being provided with nozzles and communicating with pressure chambers, at least one heat exchanger connected to suction chambers above and below the length of material, and at least one circulating fan communicating with said nozzle conduits and suction chambers,

the improvement comprising that the upper and lower nozzle conduits include ledge means between the spacings of the nozzles extending transversely to the length of material and forming together a backflow cross-cut means, the backflow cross-cut means between the ledges of the upper nozzle conduits being covered with stop means reducing the open area of said backflow cross-cut means and flow therethrough, and the backflow cross-cut means between the ledges of the lower nozzle conduits and between the lower nozzles of a lower nozzle conduit being open toward a suction chamber,

whereby a uniform discharge of drying medium is obtained from the upper and lower nozzle conduits, and a differential evacuation of drying medium in the suction chambers above and below the length of material.

4,467,538

SKI BOOT WITH LOCKING LEVER DEVICE

Icaro Olivieri, Treviso, Italy, assignor to Icaro Oliveri & C. Minuterie Metalliche S.p.A., Treviso, Italy

Filed Mar. 15, 1982, Ser. No. 358,245

Claims priority, application Italy, Mar. 16, 1981, 61925/81[U]

Int. Cl.³ A43B *5/04*

U.S. Cl. 36—121 **12 Claims**

1. A ski boot and lever locking device comprising a boot body having a front opening including opposing edges, an encircling element on the boot body adjacent to the front opening and having traction means extending near the rear of said body, a coacting locking lever for said traction means on the rear of the boot body, said traction means comprising a strap connected with the encircling element adjacent to the sole of the boot, said locking lever being engageable with said strap at the rear of the boot above the level of the boot heel, and a longitudinal substantially rigid guide element connected between said encircling element and said strap, there being a guide passage for the guide element in the heel portion of the

boot and there also being a guide slot for said strap near the rear of the boot.

4,467,539

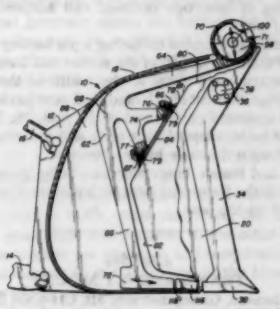
RESONANCE AIDED FRONT END LOADER

Raymond A. Gurries, Reno, Nev., assignor to Resonant Technology Company, Sparks, Nev.

Continuation of Ser. No. 313,101, Oct. 20, 1981, abandoned. This application Jun. 10, 1983, Ser. No. 503,641

Int. Cl.³ E02F *3/76*

U.S. Cl. 37—118 R **16 Claims**



1. In a front end loader having a loading bucket secured to a tractor and a transversely elongate cutter blade closely spaced forward of a lower front edge of the bucket improved apparatus for reciprocating the blade in forward and aft directions relative to the front edge of the bucket, the improvement comprising:

a force-transmitting beam having two divergent approximately straight legs that meet at a junction to form an angle of less than 180°, said beam having a resonant frequency with a node at the junction and first and second anti-nodes at the ends of the beam;

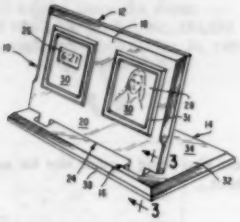
a source of vibrations at or near the resonant frequency coupled to the beam near the first anti-node to vibrate the second anti-node about a neutral position; and

means for securing the beam near the one node so as to position the neutral position of the second anti-node in spaced aft relationship from the cutter blade within striking distance thereof to apply unidirectional force impulses to the blade in a forward direction as the second anti-node vibrates to drive the blade intermittently forward.

4,467,540
DESK CLOCK AND DISPLAY STAND

George Gfesser, Jr., 1017 Schoenbeck Rd., Prospect Hgts., Ill. 60070

Continuation-in-part of Ser. No. 281,717, Jul. 9, 1981, abandoned. This application Mar. 5, 1982, Ser. No. 355,103
Int. Cl.³ G09F 3/04
U.S. Cl. 40—152.1 34 Claims



1. A display stand suitable for retaining a clock or picture on a desk or the like, the stand comprising:

(a) a base including a base plate having a top surface, a bottom surface and sides;

(b) a female hinge element defining a socket having a front wall, back wall and side walls, the front and back walls being substantially parallel, the socket having a width between the front and back walls and a length between the side walls, the female hinge element also including a finger adjacent the socket and defining at least a portion of one wall of the socket;

(c) a frame including a display panel having a front face, a back face and sides, one side being a bottom side, the panel including at least one recessed cell adapted to retain a display; and

(d) a male hinge element including a pin having a length not greater than the length of the socket and having a diameter approximately equal to the width of the socket, the male hinge element also including a post having two ends, the pin mounted on one end of the post, the female hinge element being adapted to receive and provide an interference fit with the male hinge element;

the male and female hinge elements being operably associated with the frame and base such that the frame is tiltably retained on the base.

4,467,541
TRANSPARENCY MOUNT

Sven G. Pettersson, Gimenenstrasse 3B, CH-6300 Zug, Switzerland

Filed Aug. 18, 1981, Ser. No. 293,934
Claims priority, application Sweden, Sep. 4, 1980, 8006195
Int. Cl.³ G09F 1/12
U.S. Cl. 40—158 B 5 Claims

1. A transparency mount molded in plastic as a single piece and comprising

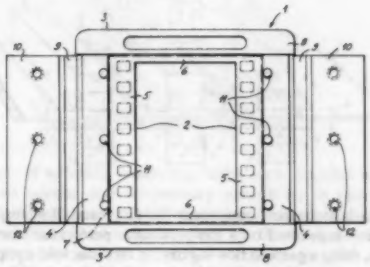
(A) a substantially square, frame-like base plate having a generally rectangular picture opening therein and being composed of two pairs of opposed frame members defining said opening,

(B) one of said pairs of frame members forming on one face of said base plate and adjacent said picture opening therein seats for corresponding opposite marginal portions of the transparency to be framed,

(C) a single pair of flap-like covering members formed integrally with said base plate and being hingedly connected to opposite outer edges of said one pair of frame members by means of thinned flexible portions of the molded piece in a manner to be foldable inwardly from free inoperative positions, in which they extend generally outwards from their respective base plate edges, into operative positions, in which they superpose respective parts of said one face of said base plate in a manner to overlap opposite marginal portions only of the transparency to be framed,

(D) each of said flap-like covering members being generally rectangular in shape and having a free outer edge extending in parallel relationship to the base plate edge, to which the flap-like covering member is hingedly connected, and at a distance from that edge which at most corresponds to the distance between said related base plate edge and the adjacent border of said picture opening in said base plate, and

(E) interengageable male and female retainer means formed integrally with the molded piece for releasably locking said flap-like covering members in their operative positions relative to said base plate,

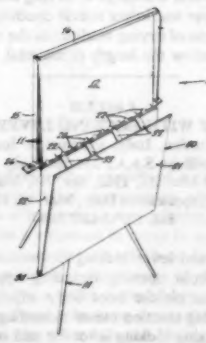


(F) the other pair of frame members of said base plate extending at right angles to those base plate edges to which said flap-like covering members are hingedly connected having on said one face of said base plate raised surface portions extending along opposite sides of said picture opening and having a height generally corresponding to the thickness of said flap-like covering members, said raised surface portions forming at least substantial parts of the two remaining base plate edges and substantially filling out the area of said one face of said base plate which is left uncovered by said flap-like covering members when they occupy their operative positions.

4,467,542
CHART SEQUENCING DEVICE

Robert E. Perry, 852 W. Las Palmas Dr., Fullerton, Calif. 92635

Filed Nov. 15, 1979, Ser. No. 94,640
Int. Cl.³ G09F 19/00
U.S. Cl. 40—530 12 Claims



1. A device for sequentially exhibiting the individual charts in a stack of charts, each of said charts having a plurality of spaced notches along the lower edge thereof, the notches on consecutive charts in said stack being misaligned, comprising:

a display area having a back surface for supporting said stack of charts, support means connected adjacent the lower edge of said back surface, and a stationary lower shelf on which said charts rest, said shelf being sloped forwardly and downwardly to direct said charts to and off the front edge thereof; and

a sliding comb assembly resting on said support means and being supported thereby for slidable movement laterally relative thereto, said comb assembly including a plurality of spaced teeth, the spacing between said teeth being the same as the spacing between said chart notches, said teeth extending upwardly and inwardly adjacent and along said front edge of said shelf to block movement of said charts off of said shelf except when the notches on a chart are aligned with said teeth, said comb assembly being slidable laterally relative to said stationary shelf to align the teeth thereof with the notches in consecutive charts to deliver consecutive charts from said display area.

4,467,543

BILLBOARD APPARATUS

Larry G. Townsend, First National Tower, Louisville, Ky. 40202

Filed Jan. 31, 1983, Ser. No. 462,539

Int. Cl.³ G09F *15/00*

U.S. Cl. 40—624 **7 Claims**

1. A billboard apparatus for providing an advertisement or the like in a protected enclosure, the apparatus comprising:

a back having a planar, rectangular configuration defining a perimetric edge, said back including a first tab extending outwardly from the perimetric edge in a first direction and a second tab extending outwardly from the perimetric edge at a location opposite the first tab and in a second direction opposite the first direction;

attachment means for attaching said back to a support surface;

a cover removably mounted on said back, said cover shaped and configured complementary to said back, said cover being at least partially transparent, said cover including a perimetric wall receivable adjacent the perimetric edge of said back, the perimetric wall including first and second slots positioned to receive therein the first and second tabs, respectively, of said back when said cover is positioned against said back with the perimetric wall adjacent the perimetric edge of said back; and

spring means for urging the perimetric wall of said cover in a direction outward from the first tab in a direction to normally displace the cover from the first tab when said cover is mounted to said back with the first slot in the perimetric wall receiving the first tab therein, the perimetric wall and the first and second tabs being sized such that the distance between the first and second slots is less than the distance from the outward tip of the first tab to the outward tip of the second tab, whereby said cover is firmly attached to said back by mounting said cover to have the first tab received within the first slot, moving said cover toward the second tab against the resistance of said spring means until the second tab may be received within the second slot, and releasing said cover to be held in position by the tabs and said spring means.

4,467,544

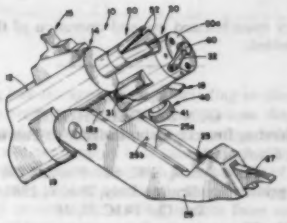
HYPODERMIC DART GUN

Phillip L. Gerwig, 2222 Nankin Rd., Ashland, Ohio 44805

Filed Sep. 30, 1982, Ser. No. 430,807

Int. Cl.³ F41C *27/00*

U.S. Cl. 42—1 R **8 Claims**



1. A hypodermic dart gun of the firearm type comprising:

an elongated barrel member having a breech end and a muzzle end, the breech end of the barrel member being adapted to receive and frictionally retain a hypodermic dart;

a pivotally mounted breech block member movable between a firing position, at which the breech block member engages and generally closes the breech end of the barrel, and a loading position, at which the breech block member disengages from said breech end to permit insertion of the hypodermic dart into said breech end,

said movable breech block member having at least two serially connected chambers for directing combustion gases from an exploded blank cartridge into the breech end of the barrel to forcibly eject the dart out of the muzzle end thereof,

the two chambers being in fluid communication with each other solely via baffle means restricting the flow of combustion gases from one chamber to the other to establish high combustion gas pressures and temperatures immediately subsequent to the exploding of the blank cartridge into one of the chambers,

the other chamber providing combustion gases to said muzzle end of the barrel, said high combustion gas temperatures and pressures causing substantially complete burning of the combustion gases; and

a firing mechanism for exploding the blank cartridge.

4,467,545

PERSONALIZED SAFETY METHOD AND APPARATUS FOR A HAND HELD WEAPON

Frederic A. Shaw, Jr., 87 Bond St., W. Gloucester, Mass. 01930

Filed Aug. 12, 1982, Ser. No. 407,346

Int. Cl.³ F41C *17/00, 17/08*

U.S. Cl. 42—70 R **10 Claims**

1. Apparatus for preventing the unauthorized firing of a hand held weapon comprising:

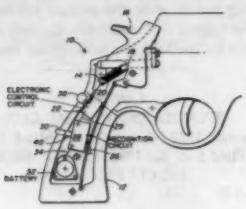
means for blocking normal operation of the weapon,

means for scanning a portion of the hand of an individual grasping the weapon,

means for comparing said scanned portion with at least one pattern, said one pattern characterizing an authorized user of the weapon,

said comparing means operating said blocking means to

render said weapon operable when a satisfactory comparison is achieved,



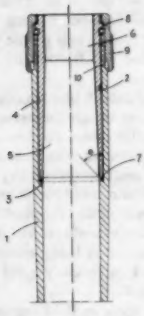
whereby unauthorized use and operation of the weapon is prevented.

4,467,546

GUN BARREL CHOKE

Pier C. Beretta, Brescia, Italy, assignor to Fabrica D'Armi P. Beretta S.p.A., Italy

Filed Jun. 4, 1982, Ser. No. 384,990
Claims priority, application Italy, Dec. 6, 1981, 7010/82[U]
Int. Cl.³ F41C *21/18*
U.S. Cl. 42—79 **4 Claims**



1. A choke for a gun barrel comprising a sleeve body having an outer cylindrical surface and an inner surface with a conical rear section and a cylindrical front section, said conical section rearwardly widening from a mouth thereof; said sleeve body being positioned rigidly within a seat provided longitudinally in said gun barrel and having an inner diameter equal to an outer diameter of said sleeve body; a rear bevelled extremity in said sleeve body mating an inclined plane surface provided on said seat; and an annular threaded projection on the outer surface of said sleeve body associated with a threaded ferrule provided on said gun barrel for connecting said sleeve body to said gun barrel; said bevelled extremity and said inclined plane surface forming an acute angle with a longitudinal axis of the gun barrel.

4,467,547

DEVICE FOR RETRIEVING A FISHING LURE

Louis Chabot, 685 Tonty, Ile Bizard, Québec, Canada H9C 2A1

Filed May 27, 1982, Ser. No. 382,562
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—17.2 **4 Claims**

1. Device for retrieving a fishing lure which is attached to a fishing rod via a fishing line and which has become snagged on an obstacle under water, said device comprising:

an annular member;

a first plurality of prongs provided on one side of said annular member along only substantially half a first the perimeter of said annular member and perpendicularly to the plane thereof, a second plurality of prongs provided on the other side of said annular member perpendicularly to the plane thereof and opposite the said first plurality of prongs, said first and second plurality of prongs having outer ends curving toward the axis of said annular member;

a pair of prongs mounted on the second half of the perimeter

of the annular member diametrically opposite one another and curving toward the annular member, said pair of prongs extending substantially tangentially from said annular member, in the plane thereof means enabling the insertion of the fishing line inside said annular member, insertion of said fishing line taking place at a point of said fishing line between said fishing lure and said fishing rod;

a strong filament;

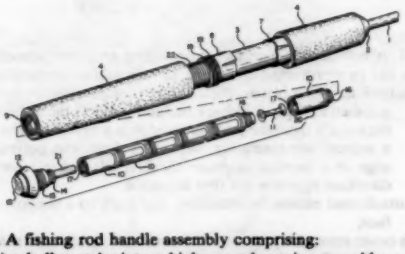
means for attaching one end of said filament to said annular member.

4,467,548

FISHING ROD HANDLE ASSEMBLY

David R. Tabor, 3730 Nashville St., Orlando, Fla. 32809

Filed Jan. 11, 1982, Ser. No. 338,547
Int. Cl.³ A01K *87/02*
U.S. Cl. 43—23 **1 Claim**



1. A fishing rod handle assembly comprising:

(a) a hollow tube into which an end cap is screwably connected;

(b) the end cap with screwable means for connecting to the hollow tube having separate additional screwable means for attaching storage compartments;

(c) interconnected and interchangeable storage compartments within said hollow tube wherein the bottom of one of said storage compartments is screwably attached to the end cap and wherein the closed top of each storage compartment screwably attaches to the open bottom of each adjacent storage compartment;

(d) means for damping motion in said compartments attached to said end cap and to a plurality of the tops of said storage compartments; and

(e) a rod fixably fastened within said hollow tube by a forward rod support and a rear rod support.

4,467,549

FISHING ROD

Jean W. Dequet, Würmseestrasse 26b, Munich, Fed. Rep. of Germany

Filed Sep. 16, 1981, Ser. No. 302,893
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1980, 8024724[U]; Feb. 17, 1981, 3105770
Int. Cl.³ A01K 87/04
U.S. Cl. 43—24 19 Claims

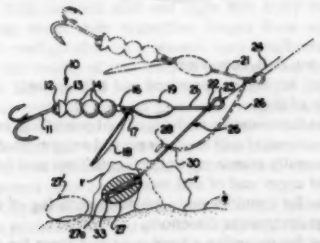
1. A fishing rod comprising at least one line guide attached to said rod, said line guide comprising an annular body made of wear-resistant material and having an essentially cylindrical outer surface in contact with said rod, a resin impregnated winding of a plurality of turns wound in a circumferential direction both around said annular body and said rod to hold said annular body in surface contact with said rod, said resin impregnated winding covering up to 100% of the axial length of said annular body with a synthetic resin positioned in a space between said rod, said guide and said windings.

4,467,550

FISHING LURE

Elvro L. Haulk, 1544 N. Stewart Rd., Mansfield, Ohio 44903

Filed Aug. 20, 1981, Ser. No. 294,450
Int. Cl.³ A01K 85/00, 95/00
U.S. Cl. 43—42.53 3 Claims



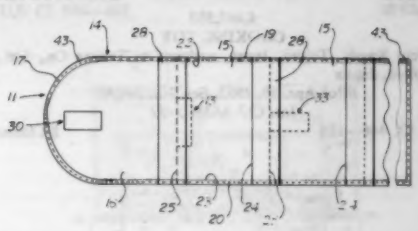
3. A method of producing a fishing lure with a removable and replaceable weight comprising forming a lure with a body having a depending keel wire formed of spring material, forming a smooth curved portion adjacent the free end of said keel wire, and positioning a removable weight having a hole therein on said keel wire by moving said curved portion through said hole, said curved portion being formed so that it provides a cord having a length equal to the length of said hole which is spaced from a parallel tangent line by a distance greater than the diameter of said hole, selecting said spring wire with sufficient elasticity to allow movement of said weight along said curved portion without substantial permanent change in the curvature of said curved portion, and including forming a reverse bend between said curved portion and the end of said keel wire of limited length and angularity with respect to said curved portion to prevent said end from digging into the surface of said hole as said weight is moved over said curved portion.

4,467,551

FISHING LURE STORAGE APPARATUS

Peggy C. Pulver, P.O. Box 908, Forsyth, Mont. 59327

Continuation-in-part of Ser. No. 287,289, Jul. 27, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,769
Int. Cl.³ A01K 97/00
U.S. Cl. 43—54.1 9 Claims



1. Fishing lure storage apparatus including an elongated base section, a plurality of separate cover sections disposed over one side of said base section, said cover sections being arranged adjacent to and overlapping each other along substantially the full length of said base section with the exception of an exposed portion at one end of said base section, the overlapping edge of each of said cover sections being remote from said exposed portion of said base section, each of said cover sections extending from a longitudinal edge of said base section to the other, each of said cover sections having a dimension along a longitudinal edge of said base section which is a fraction of the length of said base section, means affixing portions of the longitudinal edges of said base section to adjoining edges of said cover sections, means affixing along an intermediate transverse line each of said cover sections to adjoining portions of said base section, said affixed transverse line dividing each cover section into a pocket portion and an overlapping restraining portion with the pocket portion being of substantially larger size than said restraining portion, first releasable fastening means including an engageable surface disposed on said exposed end portion of said base section, said engageable surface of said first releasable fastening means being disposed on the side of said base section on which said cover sections are affixed, cooperating second releasable fastening means including an engageable surface disposed on the side of said base section opposite to the side on which said first releasable fastening means is located, said first and second releasable fastening means being located intermediate the longitudinal edges of said base section, said releasable second fastening means being spaced from said first releasable fastening means a distance approximately equal to twice the longitudinal dimension of one cover section, mounting means disposed on the side of said base section on which said second releasable fastening means is located, said mounting means being spaced approximately halfway between said first and second releasable fastening means.

4,467,552

BUBBLE BLOWING DEVICE

Jerry Jernigan, 227 Dink La., SE., Marietta, Ga. 30060

Filed Sep. 22, 1983, Ser. No. 534,607
Int. Cl.³ A63H 33/28
U.S. Cl. 446—15 3 Claims

1. A bubble blowing device formed as a unit from a single continuous length of plastics coated wire, the device compris-

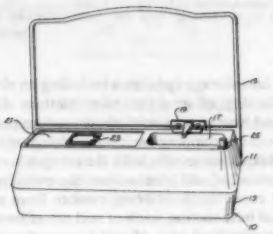
ing a substantially straight elongated rod section, and a pair of substantially circular bubble forming loops carried by the opposite ends of the rod section and being substantially in tangential relationship to the rod section and lying in mutually perpendicular planes, said loops projecting bodily laterally of the rod section.

4,467,553

COOKING TOY

Shuichi Kanda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,477
Int. Cl.³ A63H *3/52*
U.S. Cl. 446—136 **8 Claims**



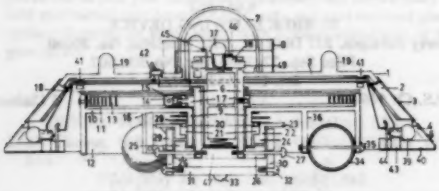
1. A simulated toy kitchen assembly set comprising:
a housing member simulating the appearance of a toy stove including a burner element;
a first magnetic member movably mounted beneath the burner element;
a motor connected to the magnetic member for driving the same;
at least one simulated food member having a magnetic portion; and
a plurality of simulated kitchen appliances each having a base configured to mount over the burner element and capable of being removably mounted over the burner element, at least one or more of the simulated kitchen appliances having a second magnetic member to provide an interaction and movement indicative of food preparation when the motor is activated and the simulated food member is positioned in the simulated kitchen appliances.

4,467,554

SPINNING TOY

James R. Russell, Apt. 401, 214 Agnes St., New Westminster, British Columbia, Canada V3L 1E6

Continuation-in-part of Ser. No. 361,419, Mar. 24, 1982, abandoned. This application Oct. 17, 1983, Ser. No. 541,481
Int. Cl.³ A63H *1/02*
U.S. Cl. 446—242 **3 Claims**



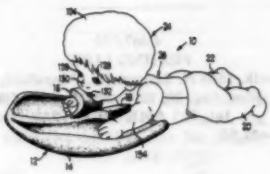
1. A spinning toy comprising:
(a) a base;
(b) a spinner rotatable with respect to said base;
(c) a spring connecting said spinner to said base; and,
(d) clutch means for maintaining said spinner fixed with respect to said base, said clutch means being disengageable, thereby enabling said spring to rotate said spinner with respect to said base; said clutch means comprising:
(i) a first portion affixed to said spinner and rotatable therewith;
(ii) a second portion
(A) drivingly engageable by said first portion in only one direction of rotation; and,
(B) drivingly engageable with said base portion; whereby rotation of said spinner, in said one direction, with respect to said base portion, places said spring in tension; and,
(iii) disengaging means for disengaging said clutch to enable said spring to rotate said spinner freely with respect to said base; said disengaging means extending between one of said clutch portions and a point below said base, whereby placement of the toy on a flat surface urges said one clutch portion away from the other of said clutch portions.

4,467,555

ANIMATED DOLL

Rouben T. Terzian, Chicago; Horst D. Herbstler, Bolingbrook, and Walter J. Wozniak, Addison, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 16, 1982, Ser. No. 348,863
Int. Cl.³ A63H *23/02, 11/10*
U.S. Cl. 446—158 **15 Claims**

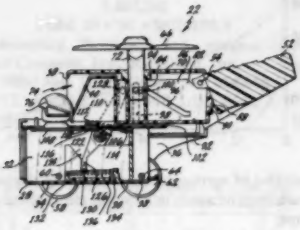


1. A toy doll, comprising:
a torso having an upper end and a lower end;
a pair of legs;
means for mounting each leg of said pair of legs adjacent said lower end of said torso for pivotal movement about an axis generally transverse to the length from said lower end to said upper end of said torso;
means for simultaneously pivoting each leg of said pair of legs in opposite directions;
means for mounting a head onto said torso for side to side pivotal movement about a pin that is at an angle to said length and said axis including a generally hemispherical head mounting member mounted adjacent the upper end of said torso in a ball and socket fashion for movement with respect to the torso;
means for connecting said simultaneous pivoting means to said means for mounting said head, to cause said head to pivot from side to side in a timed relationship with the movement of said legs;
said connecting means including a first and second cam follower, said first cam follower engaging said simultaneous pivoting means, said second cam follower engaging said first cam follower, and said second cam follower being connected to said head and to said member; and
said connection between said second cam follower and said head including means which permits positioning said head in one of at least two tilted positions by manually moving the head in a direction substantially transverse to the side to side pivotal movement of said head.

4,467,556
TOY VEHICLE CAPABLE OF CHANGING SIZE AND SHAPE

Noriaki Iwao, Japan, and Akira Abe, both of Tokyo, Japan, assignors to Tomy Kogyo Company, Inc., Japan

Continuation-in-part of Ser. No. 170,260, Jul. 18, 1980, abandoned. This application Nov. 25, 1981, Ser. No. 324,737
Int. Cl.³ A63H 11/10
U.S. Cl. 446—230 5 Claims

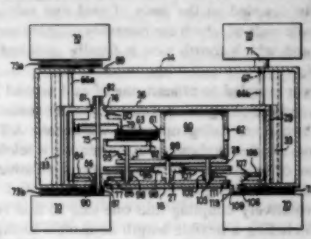


1. A toy vehicle which comprises:
a chassis, said chassis including a plurality of wheels attached to said chassis for supporting said vehicle on a support surface;
a vehicle body attached to said chassis, said body having a front, a back, a top, a left side and a right side;
said body including a left side body member movably mounted about a hinge to said left side of said body, said body including a right side body member movably mounted about a hinge to said right side of said body, said left side body member in a first closed configuration forming a portion of the left side and top of said body, said right side body member in said first closed configuration forming a portion of said right side and said top of said body, both said left and said right side body members pivoting about their respective hinges from said first closed configuration to a second open configuration to locate the totality of said left side body member outboard of said left side and the totality of said right side body member outboard of said right side respectively to increase the width of said body as measured between said left side and said right side in said first closed configuration and said left side and said right side body members in said second open configuration;
a third body member movably mounted to said body so as to form a portion of the top of said body in said first configuration and having at least a portion thereof which extends away from said top of said body in said second configuration, said third body member moving on said body both (a) between said first and said second configurations and (b) with respect to said body when in said second configuration;
spring means operatively associated with said third body member so as to bias said third body member from said first configuration to said second configuration;
retaining means operatively associated with said third body member to maintain said third member in said first configuration against the bias of said spring means;
means operatively associating said third body member with said left side and said right side body members so as to convey motion of said third body member, in moving from said first configuration to said second configuration, to said left side and said right side body members to move said left side and said right side body members from said first configuration to said second configuration.

4,467,557
SHIFTABLE DRIVE SELF-PROPELLED TOY VEHICLE

Wayne A. Kuna, Oak Park, and John R. Wildman, North Riverside, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 6, 1982, Ser. No. 447,434
Int. Cl.³ A63H 17/00
U.S. Cl. 446—463 20 Claims

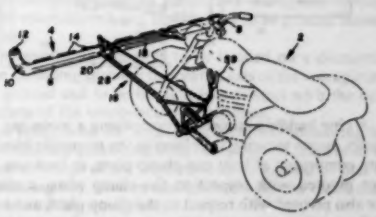


1. A motor driven toy wheeled vehicle comprising:
a body;
a chassis to which the body is attached;
a rear axle and wheel assembly supported for rotation by the chassis;
a front axle and wheel assembly supported for rotation by the chassis;
a motor carried by the chassis;
first transmission means for driving engagement between the motor and one axle and wheel assembly;
second transmission means for driving engagement between the motor and both the rear and front axle and wheel assemblies;
a gear box carried by the chassis for movement relative to the chassis;
the first and second transmission means being supported by the gear box; and
shift means for moving the gear box to selectively engage either the first or second transmission means in its said driving engagement.

4,467,558
ALL TERRAIN HERBICIDE APPLICATOR SYSTEM

Robert Rathman, Rte. 1, Box 147, Cairo, Nebr. 68824

Filed May 6, 1983, Ser. No. 492,168
Int. Cl.³ A016 13/00
U.S. Cl. 47—1.5 3 Claims



1. Apparatus for applying treatment chemicals to plants comprising in combination:
a relatively light weight and highly maneuverable balloon tired all terrain vehicle (ATV);
an elongated tubular reservoir having a plurality of wick segments mounted therealong and extending forwardly thereof and containing plant treatment chemicals for dispensing said chemicals via contact between said wick segments with said plants; and

support means coupling said chemical dispensing means to said ATV for independently and selectively varying the elevation of said reservoir and/or rotating said reservoir to vary the angle of said wick segments with respect to said plants, said support means including:

a four sided frame, one side of which is coupled to said reservoir, second and third sides of which are bent downward and the forward most ends of which are fixedly coupled to the ends of said one side and the opposite ends of which are rotatably coupled to a fourth side and which fourth side is fixedly attached to said ATV;

a tilt lever coupled to at least one of said second or third sides and including an operator accessible detent assembly, said lever being operable while said ATV is in motion to selectively vary and maintain a selected elevation of said one side and reservoir relative to the ground with changing ground conditions; and

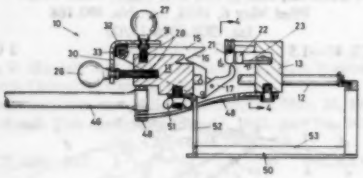
means rotatively coupling said one side to said reservoir and including a flexible length adjustable linkage comprised of joined lengths of rope and chain and an associated chain link capture mechanism mounted to said tilt lever for selectively and rotatively varying the angle at which said treatment chemicals are dispensed relative to the ground via the lengthening or shortening of said linkage relative to said capture mechanism and thereby permitting an operator to vary the angle of dispersion while in motion, depending on ground conditions.

4,467,559

CHIP BUDDING MACHINE

Terry W. Riley, Adelaide, Australia, assignor to Techsearch, Inc., Adelaide, Australia

Filed Oct. 8, 1982, Ser. No. 433,553
Claims priority, application Australia, Oct. 8, 1981, PF1109
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—7 **8 Claims**



1. A chip budding implement comprising a mounting block, a clamp, means securing the clamp to the mounting block, said clamp comprising at least one clamp plate, at least one clamp finger pivoted with respect to the clamp plate, a clamping lever also pivoted with respect to the clamp plate, and a spring coupling the clamping lever to the clamp finger, the clamp plate and clamp finger being a shape suitable for clamping a cane of a plant and the spring being operable to effect said clamping upon movement of the lever,

a knife block having a plurality of knives arranged in a dovetail configuration facing the clamp,

guide means coupling the blocks for relative movement in a direction towards or away from one another, and

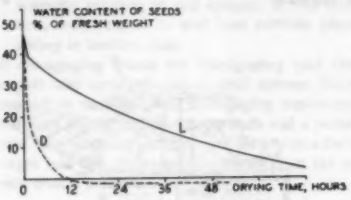
motion imparting means linking the blocks for effecting said relative movement.

4,467,560

METHOD FOR SORTING OF SEED

Milan Simäk, Björnvägen 440, S-902 60 Umea, Sweden

Filed Oct. 12, 1982, Ser. No. 433,737
Claims priority, application Sweden, Oct. 9, 1981, 8105997
Int. Cl.³ A01B *79/00*
U.S. Cl. 47—58 **3 Claims**



1. A method of sorting seeds, comprising the steps of:

(a) incubating the seeds in a humid atmosphere for a period of time;

(b) thereafter drying the seeds in a less humid atmosphere for a period of time, thereby producing a pronounced difference in moisture content between viable and non-viable seeds; and

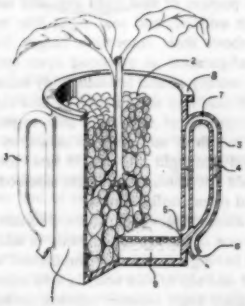
(c) by using the moisture content difference, separating non-viable seeds from viable seeds.

4,467,561

WATER-LEVEL CONTROLLED HYDROPONIC CONTAINER

Akira Tsuchiya, 8-5, Shinmachi 2-chome, Hino-shi, Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,346
Claims priority, application Japan, Aug. 18, 1982, 57-142102
Int. Cl.³ A01G *31/00*
U.S. Cl. 47—60 **3 Claims**



1. A hydroponic plant growing device comprising:

a container having a bottom wall and an integral side wall extending upwardly from the peripheral edge of said bottom wall wherein said bottom wall and side wall together define an open top cavity adapted to receive and hold a particulate plant growing medium and nutrient solution; and

at least one siphon generating means projecting from and extending through side said wall, said siphon generating means having an inlet opening in fluid communication with the interior of said container and being positioned at a predetermined distance above said bottom and below the upper level of said growing medium wall to receive liquid therefrom, said siphon generating means having an outlet opening in fluid communication with the exterior of

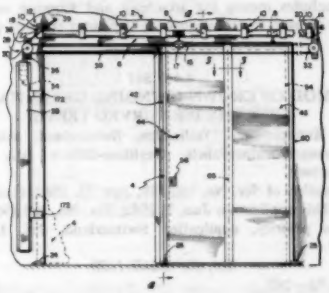
said container and being positioned below said inlet to discharge liquid therefrom, and the vertical dimension of said siphon generating means being such that the uppermost edge thereof is positioned a substantial distance below a maximum fluid level of said container so as to allow passage of liquid therethrough before the liquid within said container reaches the maximum level and causing said container to drain to the level of said inlet opening.

4,467,562

FIRE DOOR ASSEMBLY

Gene A. Hemmerling, Richmond, Ind., assignor to American Metal Door Company, Inc., Richmond, Ind.

Filed Sep. 15, 1982, Ser. No. 418,444
Int. Cl.³ E05D *13/02*; E06B *3/00*; E04C *1/10*
U.S. Cl. 49—411 **15 Claims**



1. A fire door assembly for closing an opening in a wall, the door assembly comprising

at least two panels having edges to be connected,

interconnecting means for connecting an edge of one of the door panels to an adjacent edge of the other door panel in edge-to-edge relationship,

flame-resistant means providing a flame barrier between said interconnecting means and the edges of the panels,

track means for slidably supporting the interconnected panels, and

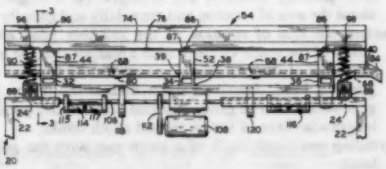
mounting means for mounting the track means to the wall above the opening.

4,467,563

VIBRATORY FINISHING APPARATUS

Ronald L. Yoder, Topeka, Ind., assignor to Universal Consolidated Methods, Inc., Topeka, Ind.

Filed Dec. 31, 1981, Ser. No. 336,457
Int. Cl.³ B24B *31/06*
U.S. Cl. 51—163.1 **10 Claims**



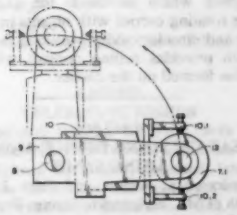
1. Finishing apparatus comprising an elongated container having an open top, said container being disposed with its longitudinal axis horizontal, means comprising a plurality of spaced generally flat partitions for dividing said container into a plurality of individual compartments arranged in tandem from end-to-end thereof, said container and compartments being part-cylindrical about said axis, with the part-cylindrical shape being greater than a half cylinder with the transverse dimension of said open top being less than the maximum transverse dimension of the cylinder, a plurality of drain orifices in the bottoms of said compartments whereby the flow of fluid and particulate matter is through said compartments individually from top to bottom, and means including means for mounting said container on a stationary support for substantially free movement in space having an elongated carriage frame to which said container is secured in parallelism, said mounting means including a plurality of upright helical compression springs interposed between said frame and support to support the load of said container, a shaft mounted on said frame for rotation about an axis parallel to said longitudinal axis including at least one eccentric weight and at least one fly wheel on said shaft for vibrating said container and its compartments so as to subject each compartment to substantially the same motion, a single elongated fluid-collecting channel shaped member secured beneath the underside of said container with the open side thereof positioned to collect drainage from said compartments simultaneously, said channel-shaped member being a secured part of said carriage frame.

4,467,564

ARRANGEMENT OF A MEASUREMENT CONTROLLING DEVICE IN CIRCULAR GRINDING MACHINES

Manfred Haustein, Karl-Marx-Stadt, German Democratic Rep., assignor to VEB Werkzeugmaschinenbau, Berlin, German Democratic Rep.

Filed Jun. 29, 1981, Ser. No. 278,120
Claims priority, application German Democratic Rep., Jul. 10, 1980, 222528
Int. Cl.³ B24B *49/02*
U.S. Cl. 51—165 R **3 Claims**



1. A measuring controlling device for a circular grinding machine including grinding means and workpiece retaining means for rotatably holding a workpiece to be ground thereon, comprising

two measuring key devices to be located on a diametrical line extending through the central axis of the workpiece to be ground and to be brought into contact with the outer surface of the workpiece therebetween,

a measuring head for supporting said two measuring key devices, said measuring head being moved relative to the axial direction of the workpiece to be ground so that the measuring key devices can contact with the entire outer surface of the workpiece,

a feeding link for supporting the measuring head,

a workpiece shifting device connected to the feeding link so that when the shifting device is operated, the measuring head and the feeding link are moved laterally and vertically relative to the shifting device, and

a mounting connected to the feeding link, said mounting having a positioning piece at one end so that the positioning piece receives a workpiece to be ground and retains the workpiece in association with the workpiece retaining means for grinding and releases the ground workpiece therefrom, whereby the workpiece can be ground by

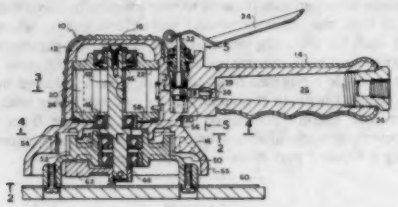
means of the grinding means into a predetermined profile with reference to the actual profile measured by the measuring key devices.

4,467,565

ROTARY AND ORBITAL SANDER

William K. Wallace, Barneveld; David A. Giardino, Deerfield, and Joseph R. Groshans, Clinton, all of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,642
Int. Cl.³ B24B *23/04*
U.S. Cl. 51—170 MT 4 Claims



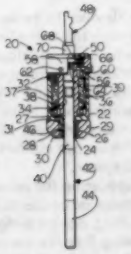
1. A rotary orbital sander comprising in combination, a motor housing enclosing a motor means, a drive shaft rotable by the motor means, said drive shaft having an axially offset portion, a pinion gear housing affixed to the motor housing, a carried supported on the shaft offset portion by bearing means, gear means on the pinion gear housing, gear means on the carrier which mesh with the gear means of the pinion gear housing, a counter-balancing weight having a center of gravity of rotation in the same plane as the center of gravity of rotation of—the carrier, the bearing means, and a sanding pad assembly which may be affixed to the carrier—said pinion gear housing having a portion which surrounds the carrier to prevent contact of the rotating carrier with objects in close proximity to the sander and circular cavity provided in the pinion gear housing which provides rolling contact with a peripheral circular portion formed on the carrier.

4,467,566

VALVE SEAT GRINDING DEVICE AND TOOL FOR USING SAME

Joseph F. Ondrus, Jr., Affton, and John J. Schimweg, St. Charles, both of Mo., assignors to Sunnen Products Company, St. Louis, Mo.

Filed Jan. 29, 1982, Ser. No. 343,824
Int. Cl.³ B24B *19/00*
U.S. Cl. 51—241 VS 34 Claims



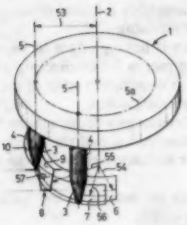
1. A tool for grinding valve seats in engines and the like comprising a support structure having inner and outer portions with journal means positioned therebetween to enable relative rotational movement therebetween, a guide member for mounting in a valve guide in position extending outwardly from a valve seat to be ground, said guide member having a first portion for positioning in a valve guide and a cylindrical portion extending from the valve guide and located extending through the valve seat and associated surfaces to be ground, means on the inner support structure for slidably engaging the cylindrical portion of the guide member to permit axial movement therealong, an annular metal member having axially spaced opposed end faces and a cylindrical outer surface therebetween, one of said opposed end faces being frusto-conical in shape and contoured to the desired shape of a valve seat surface to be ground thereby, said one end face having a plurality of spaced surface grooves and adjacent surface portions formed thereon, a work engaging surface layer formed of a relatively hard wear resistant material and a binder formed on said one end face of said metal member, means for attaching and aligning the metal member on the outer support portion, said outer support portion having spaced opposite ends one of which includes means for coupling to a drive source for rotating the outer member relative to the inner member and the other includes means for attaching and aligning said metal member thereto for rotation with the outer support portion.

4,467,567

METHOD OF CROWN GRINDING GEARS HAVING LENGTHWISE CURVED TEETH

Erhard Konersmann, Wallisellen, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Continuation of Ser. No. 162,389, Jun. 23, 1980, abandoned.
This application Jun. 7, 1982, Ser. No. 385,895
Claims priority, application Switzerland, Jul. 12, 1979, 6503/79
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—287 4 Claims



1. A method of crown grinding gears having lengthwise curved teeth, comprising the steps of:

providing substantially truncated cone-shaped, individually driven grinding elements rotatable about their lengthwise axes;

mounting said grinding elements in a grinding head rotatable about an axis of rotation in such a manner that all axes of said grinding elements are arranged on a single circle about the axis of rotation and are axially and radially fixed;

setting the axis of rotation of the grinding head and the radius of the single circle in such a manner that the lengthwise axes of the grinding elements, during rotation of the grinding head, describe paths which at the region of the gear which is to be ground extend substantially parallel to lengthwise lines of the unground tooth flanks;

grinding one tooth flank of a tooth gap with the grinding head;

displacing the axis of rotation of the grinding head and adjusting such with respect to the other tooth flank of the tooth gap; and

thereafter grinding the other tooth flank of the tooth gap with the grinding head, while the lengthwise axes of the grinding elements remain set at the same circle as during the grinding of the one tooth flank.

4,467,568

GENERATING METHOD FOR THE CHIP-PRODUCING MACHINING OF INVOLUTE TOOTH FLANKS WITH PROFILE AND LONGITUDINAL CORRECTIONS

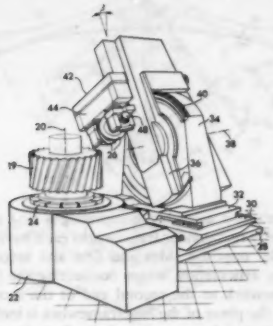
Peter Bloch, Mutschellen; Robert Wydler, Zurich, and Erwin J. Gunter, Widen, all of Switzerland, assignors to Maag Gear-Wheel & Machine Co. Ltd., Zurich, Switzerland

Filed Sep. 7, 1982, Ser. No. 415,360

Claims priority, application Switzerland, Sep. 14, 1981, 5921/81

Int. Cl.³ B24B 1/00

U.S. Cl. 51—287 5 Claims



1. A generating method for the chip-producing machining of involute-shaped tooth flanks using a machine tool containing one or two tools in a 15°/20° configuration each constructed as a dished, cone or double-cone shaped tool, said method comprising the steps of:

moving each said tool to-and-fro in a stroke-like fashion along the tooth flanks in an engagement field defined at the related tooth while feeding each said tool in the direction of the tooth flanks so as to act upon a respective tooth flank at one or two work positions;

predetermining the displacement of each said tool for generating profile and longitudinal corrections for each work position (S_a and S_i, coordinates g_a, h_a, g_i, h_i) in said engagement field; and

controlling the displacement of each said tool for generating the profile and longitudinal corrections at each said work position as a function of the generating position and the stroke position of each said tool according to the following equations:

$$S_a \cdot g_a = Q_4 \cdot \sin\beta_b - g^*$$

$$h_a = h^* + Q_4 \cdot \cos\beta_b$$

$$S_i \cdot g_i = g^* + Q_3 \cdot \sin\beta_b$$

$$h_i = h^* - Q_3 \cdot \cos\beta_b$$

wherein:

$$g^* = L_n \cdot \frac{\cos\beta \cdot \cos\alpha}{\cos\gamma} + W \cdot \frac{\cos\alpha}{\cos\gamma} - H \cdot \frac{\sin\beta \cdot \cos\alpha}{\cos\gamma}$$

$$h^* = L_n \cdot \sin\beta \cdot \cos^2\alpha - W \cdot \sin^2\alpha \cdot \tan\beta +$$

$$H\left[\cos\beta + \frac{\sin^2\alpha \cdot \sin^2\beta}{\cos\beta}\right]$$

-continued

$$Q_4 = \sqrt{R_s^2 - \left(R_s - \frac{h_{aor}}{\cos\alpha} + y\right)^2 \cdot \cos^2\gamma} + \left(R_s - \frac{h_{aor}}{\cos\alpha} + y\right) \cdot \sin\gamma$$

$$y = \left(\frac{L_n}{\tan\beta} + \frac{W}{\sin\beta} - H\right) \tan\gamma$$

$$Q_3 = \sqrt{R_s^2 - \left(R_s - \frac{h_{aor}}{\cos\alpha} + y\right)^2 \cdot \cos^2\gamma} + \left(R_s - \frac{h_{aor}}{\cos\alpha} + y\right) \cdot \sin\gamma$$

H = tool stroke

L_n = half tooth gap width

Q_3 = partial spacing at the grinding chord from the orientation point P to the inner intersection point P_i of the grinding wheel edge

Q_4 = partial spacing at the grinding chord from the orientation point P to the outer intersection point P_a of the grinding wheel edge

R_S = radius of the circular-shaped tool edge

W = generating path

h_{aor} = tooth addendum height of the tool

y = spacing of the orientation point P from the reference line N'N" at the tool gear rack flank

α = angle of attack

β = tooth helix angle

β_b = base helix angle

β = angle between flank contact line and base line

4,467,569

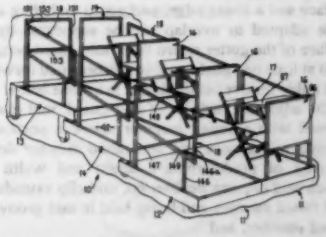
TELESCOPIC RISERS

Russell O. Blanchard; Douglas F. Wolff, both of Marshall; Charles E. Steele, Pennfield Township, Calhoun County, all of Mich., and Richard P. Molloy, deceased, late of Portage, Mich. (by Vera C. Molloy, heir and legal representative), assignors to Interkal, Inc., Kalamazoo, Mich.

Filed May 3, 1982, Ser. No. 374,112

Int. Cl.³ E04H 3/12

U.S. Cl. 52—9 21 Claims



1. A telescopic multi-tier riser assembly, comprising:

a plurality of telescopic multi-tier riser modules positionable in side-by-side relationship to define an enlarged riser assembly;

each said riser module being of a telescopic multi-tier construction and indluding top and bottom platforms and at least one intermediate platform, said platforms being telescopically movable relative to one another between an

open position wherein the individual platforms project forwardly in a step-like manner and a closed position wherein the platforms are vertically supported one above the other;

said platforms each having a side-to-side width which is substantially less than its front-to-back length, said width being such as to comfortably accommodate only a single chair on the respective platform;

a modesty panel assembly hingedly supported on each platform adjacent the forward edge thereof and swingably movable relative to the respective platform between an upright use position and a horizontal storage position wherein the modesty panel assembly is supported on the upper surface of the respective platform;

said platform including a pair of upwardly opening sockets formed therein adjacent the front edge thereof; and

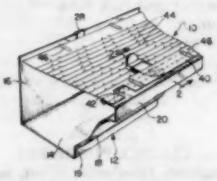
said modesty panel assembly having a pair of support posts which have the lower ends thereof connected to hinge means which are vertically slidably accommodated within said sockets for permitting the modesty panel assembly to be swingably moved between said upright and storage positions.

4,467,570

GUTTER GUARD AND LOCKING CLIP THEREFOR

Harry F. Kriegel, Warren, N.J., assignor to Royal-Apex Manufacturing Co. Inc., Plainfield, N.J.

Filed Jul. 20, 1981, Ser. No. 285,017
Int. Cl.³ E04D *13/00*
U.S. Cl. 52—12 **9 Claims**



1. A gutter guard and locking snap clip for such guard for use with rain gutters in order to prevent leaves and other debris from clogging the outlet of the gutter, comprising

(a) a gutter guard formed with louvre type slots to permit rain to pass therethrough to said gutter for runoff but prevent leaves or other debris from passing through said guard, said gutter having a gutter return bead with a top surface and a lower edge, said guard including a forward edge adapted to overlap and be supported by the top surface of the gutter return bead, said guard being formed with at least one guide groove adjacent said forward edge, said guide groove being located in a plane below the plane of the adjoining surfaces of said guard, said guard being formed with a raised member above a portion of said groove, said groove and said raised member defining an opening of predetermined height and width through which said clip can be inserted, said clip extending under said raised member and being held in said groove by said raised member, and

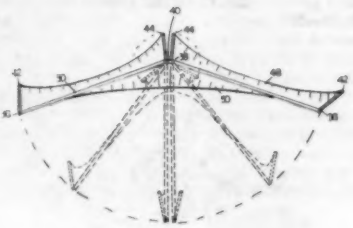
(b) a locking snap clip for locking said guard to said gutter, said clip being smaller in width than said groove, said clip being formed with a leading end having at least one surface irregularity adjacent a plane of said leading end, said surface irregularity being adapted to cooperate with a reversely bent flange of said gutter return bead so as to removably lock said clip, and thus said guard, to said gutter.

4,467,571

CONSTRUCTION UNITS AND ASSEMBLIES, AND STRUCTURES FABRICATED FROM SUCH UNITS AND ASSEMBLIES

William F. Logan, #70 Laight St. - 5th Floor, New York, N.Y. 10013

Filed Jun. 10, 1981, Ser. No. 272,139
Int. Cl.³ E04B *1/346*
U.S. Cl. 52—63 **7 Claims**



1. A construction assembly comprising a first and second similar generally rectangular frameworks each having first and second parallel opposite sides and first and second parallel opposite ends, articulation means connecting the first end of the first framework to the second end of the second framework, so that the plane of the first framework is inclined to the plane of the second framework and the first sides of the first and second frameworks are substantially coplanar and the second sides of the first and second frameworks are substantially coplanar, first and second arch structures each of which has two end portions separated by a distance substantially equal to the distance between the opposite sides of each framework and an intermediate portion which connects the two end portions together, means connecting the two end portions of the first arch structure to the first framework at the first end thereof so that the intermediate portion of the first arch structure is spaced from the plane of the first framework and the distance of the intermediate portion of the first arch structure from the second end of the first framework is variable, means connecting the two end portions of the second arch structure to the second framework at the second end thereof so that the intermediate portion of the second arch structure is spaced from the plane of the second framework and the distance of the intermediate portion of the second arch structure from the first end of the second framework is variable, means for restricting movement of the arch structures relative to each other, a first portion of sheet material having edge regions connected respectively to the first arch structure and the first and second opposite sides of the first framework, a second portion of sheet material having edge regions connected respectively to the second arch structure and the first and second opposite sides of the second framework, and a third portion of sheet material having edge regions connected respectively to the first and second sides of the first and second frameworks, the first and second frameworks lying between the third portion of sheet material and the first and second portions of sheet material.

4,467,572

COLLAPSIBLE DWELLING FOR CHILDREN OR ANIMALS

Rex E. Somers, 816 W. Washington Blvd., Fort Wayne, Ind. 46804; Ray A. Beasey, R.R. #6, Huntington, Ind. 46750, and Richard E. Woods, P.O. Box 393, Markle, Ind. 46770

Filed Apr. 5, 1982, Ser. No. 365,171
Int. Cl.³ E04B *7/16*
U.S. Cl. 52—70 **10 Claims**

1. A collapsible dwelling comprising:

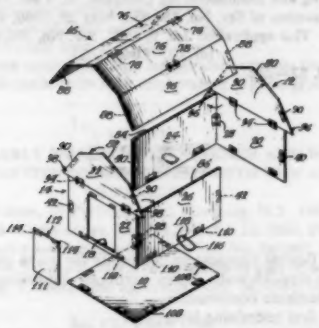
first and second foldable wall elements, each said wall element including:

(a) an endwall;

(b) a sidewall having a top edge, height substantially equal to that of the endwall and hingedly joined with the endwall for pivoting movement about a substantially vertical axis; and

(c) a gable having a width greater than the width of the endwall and being hingedly secured with the endwall for pivoting movement about a substantially horizontal axis;

a first means for mating said first and second foldable wall elements, each with the other, so as to define a continuous wall structure;



a roof element positionable atop the gables whereby an airspace is formed between the top edge of each of the sidewalls and the underside of the roof element to afford cross-ventilation inside the dwelling; and

a second means for mating said roof element with the gables;

said roof and said first and second wall elements, when collapsed, being stackable in such a manner that the entire dwelling occupies a space no greater than the length of the longest element and the width of the widest element so that the dwelling can be retained compactly within a container.

4,467,573

CONTAINER FOR AN INDUSTRY HALL

Fritz Langerbeck, Malmö , Sweden, assignor to Kjessler & Mannerstrale AB., Malmö , Sweden

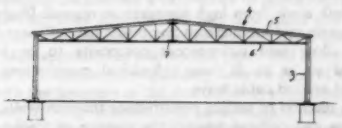
PCT No. PCT/EP81/00017, § 371 Date Nov. 9, 1981, § 102(e) Date Nov. 9, 1981, PCT Pub. No. WO81/02599, PCT Pub. Date Sep. 17, 1981

PCT Filed Feb. 28, 1981, Ser. No. 321,179

Claims priority, application Sweden, Mar. 7, 1980, 8001790

Int. Cl.³ E04B *1/343*

U.S. Cl. 52—79.5 **4 Claims**



1. A package for transport of components of a hall, wherein the hall comprises at least four roof support beams, four gable beams and eight mounting members; the roof support beams being interconnected in pairs and in parallel in order to form at least two rectangular composite frames; that at the upper and lower long side of each rectangular composite frame a gable beam is connected, that each gable beam comprises a number of mounting ears with mounting holes; that the mounting members consist of beams with mounting holes; that the mounting members are connected with the mounting ears of the gable beams and are transversally directed perpendicular to the rectangular composite frames; that the mounting members of two spaced parallel rectangular composite frames face and overlap each other and are interconnected in such a way that the two rectangular composite frames are positioned at a predetermined distance from each other, thereby forming the side surfaces of a rectangular container; that the dimensions of the container correspond to the dimensions according to the international regulations for a transport container; and that the said parts can be disassembled for the subsequent assembly into a hall.

4,467,574

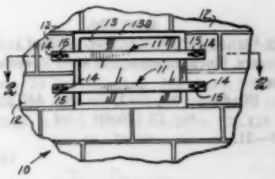
SECURITY DEVICE FOR BASEMENT WINDOWS

John J. Falge, 4696 NE. Townline Rd., Marcellus, N.Y. 13108; James A. Albanese, 310 Wheaton Rd., Syracuse, N.Y. 13203; Arthur W. Loran, 4667 Antoinette Dr., Marcellus, N.Y. 13108, and E. Alan Locklin, 424 Sunrise Dr., Syracuse, N.Y. 13205

Filed May 11, 1981, Ser. No. 262,510

Int. Cl.³ E04H *3/08*

U.S. Cl. 52—106 **3 Claims**



1. A security device for basement windows, comprising, in combination, a pair of parallel, spaced-apart bars secured to the outer faces of blocks defining an opening in which a window and frame are secured, a pair of parallel, spaced-apart channel members secured to the inside faces of said blocks, a plurality of bolt fasteners and nut fasteners received in said channel members for securing said bars and said channel members to said blocks, and an offset wrench for tightening or loosining said nut fasteners.

4,467,575

INTERNALLY DRIVEN EARTH ANCHOR HAVING SMALL DIAMETER ANCHOR ROD

Edward Dziedzic, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Jun. 9, 1983, Ser. No. 502,587

Int. Cl.³ E02D *5/80*

U.S. Cl. 52—157 **7 Claims**

1. An earth anchor comprising:

an elongated rod having an earth-penetrating lead adjacent

one end thereo, an outwardly extending flange adjacent said lead, and a drive boss adjacent said flange, said boss being polygonal in cross-section for a portion thereof;

an anchor member including an elongated, bore-defining hub and an outwardly extending load-bearing element secured to said hub; and

an apertured plate secured to said hub and disposed transverse to the longitudinal axis of the hub, said plate aperture being dimensioned and arranged for clearance of said drive boss,

said rod extending into said hub bore, with said flange being adjacent one end of said hub and said boss extending through said plate aperture such that portions of said hub bore surround said boss in spaced relationship thereto for cooperatively defining a wrench-receiving area,

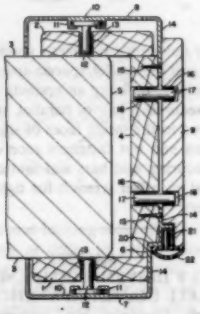
the configuration of said hub bore portions and said boss being correlated such that said wrench-receiving area is sufficient for passage of a complemental wrench tube between said hub bore portions and said boss, for establishing a driving engagement between said tube, boss, and bore portions, whereby axial rotation distributes rotative driving forces from the tube to the rod and anchor member and effects corresponding rotation to said rod and anchor member in unison, in order to facilitate installation of the anchor into the earth.

4,467,576

OUTER FRAME FOR FACING A WALL OPENING

Helmut Bürgers, Hochgernstrasse 3, 8200 Rosenheim, Fed. Rep. of Germany

Filed Nov. 10, 1982, Ser. No. 440,568
Int. Cl.³ E06B 1/04
U.S. Cl. 52—212 **4 Claims**



1. A frame for covering an opening in a wall, and specifically for covering the soffit surface of said wall opening, and that part of at least one of the two wall surfaces adjacent said soffit surface, said frame comprising in combination:

a separate liner located ahead of, i.e. spaced from and substantially parallel to, said soffit surface;

at least one covering respectively located on one of said two wall surfaces at right angles to an adjacent edge of said separate liner; each covering comprises a U-shaped, thin-walled profiled member having a base which is substantially parallel to an associated wall surface, and two legs which extend perpendicular to said base; one leg of each of said profiled members faces said wall opening and projects beyond the plane of said soffit surface; said separate liner being mounted on the outer side of said one leg; each of said profiled members, on that side of said base thereof which faces the associated wall surface, being provided with at least one rail which extends in the longitudinal direction of said profiled member;

fastening dowels, each of which has an enlarged end which is adapted to be received by said rail in such a way as to be movable therein and to project at right angles therefrom toward the associated wall surface; that end of each of said fastening dowels remote from said enlarged end thereof being adapted to be inserted in bores operatively associated with said wall surface for effecting connection of said profiled member with said wall surface; and

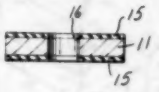
connection means for securely holding said separate liner on said one leg of said profiled member.

4,467,577

INTUMESCENT FIRE BARRIER MATERIAL LAMINATED WITH RESTRAINING LAYER

Richard R. Licht, New Richmond, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 154,455, May 29, 1980, abandoned.
This application Jul. 9, 1982, Ser. No. 396,676
Int. Cl.³ E04C 2/00
U.S. Cl. 52—232 **11 Claims**



1. A flexible intumescent composite for use in sealing penetrations through walls, floors, partitions and ceilings comprising in laminate combination:

(a) a first restraining layer;

(b) a layer of intumescent sheet material; and (c) a second restraining layer;

said composite constructed so that said first restraining layer forms one major exterior surface of said intumescent composite and said second restraining layer forms the other major exterior surface of said intumescent composite, said intumescent material being capable of expansion when subjected to elevated temperatures, and wherein said restraining layers:

(a) will not decompose or soften before the intumescent sheet material has had a chance to expand;

(b) have sufficient tensile strength to resist tearing during expansion of the intumescent sheet material; and

(c) are bondable to the intumescent sheet and resist delamination throughout the expansion process;

when said composite is subjected to temperatures over about 110° C., wherein said restraining layers will withstand temperatures of about 150° C. before beginning to soften or degrade, and wherein said restraining layers are:

(1) metal foil which is up to 0.064 mm thick;

(2) metal screen;

(3) heavy paper or cardboard;

(4) a high temperature rubber sheet;

(5) a high temperature plastic sheet;

(6) screen made from inorganic fibers;

(7) cloth made from inorganic fibers;

(8) screen made from high temperature organic fibers; or

(9) cloth made from high temperature organic fibers;

and wherein said intumescent composite has sufficient flexibility to allow said intumescent composite to be helically wrapped so as to fit into cylindrical penetrations or be wrapped around cable trays.

11. A method of sealing penetrations through walls, floors, partitions and ceilings against the passage of smoke or fire comprising placing an intumescent composite into said penetrations in such a way that at least one major exterior surface of said intumescent composite is in juxtaposition to the walls of said penetration; said intumescent composite comprising in laminate combination:

(a) a layer of intumescent sheet material; and

(b) a restraining layer; said composite constructed so that said restraining layer forms that major exterior surface of said composite which is not in juxtaposition to the walls of said penetration, said intumescent material being capable

of expansion when subjected to temperatures over about 110° C., and wherein said restraining layer and said walls of said penetration:

(a) will withstand temperatures of about 150° C. before beginning to soften or degrade;

(b) having sufficient tensile strength to resist tearing during the expansion of the intumescent sheet material; and

(c) are bondable to the intumescent sheet and resists delamination throughout the expansion process;

and wherein said restraining layer is:

(1) metal foil which is up to 0.064 mm thick;

(2) metal screen;

(3) heavy paper or cardboard;

(4) a high temperature rubber sheet;

(5) a high temperature plastic sheet;

(6) screen made from inorganic fibers;

(7) cloth made from inorganic fibers;

(8) screen made from high temperature organic fibers; or

(9) cloth made from high temperature organic fibers.

4,467,578

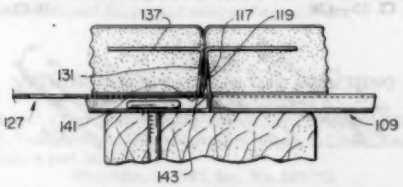
CONCEALABLE WALLBOARD FASTENER AND WALLS AND PARTITIONS ASSEMBLED WITH THE AID THEREOF

Roger N. Weinar, 19 Parkside Ave., Hamburg, N.Y. 14075

Continuation-in-part of Ser. No. 171,331, Jul. 23, 1980, Pat. No. 4,296,580, and a continuation-in-part of Ser. No. 184,961, Sep. 8, 1980, Pat. No. 4,333,286, and a continuation-in-part of Ser. No. 289,709, Aug. 3, 1981,. This application Oct. 26, 1981, Ser. No. 314,771

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—281 **18 Claims**



1. A readily dismantlable wall or partition comprising a substructure and a surface structure, said substructure including framing or supporting means for holding the surface structure to and spaced away from the substructure, and said surface structure comprising first and second aligned substantially flat panels, adjacent at sides thereof, each of which has concealed major back, sides, top and bottom surfaces and a visible major front surface, the sides of which panels are substantially smooth, which panels are substantially invisibly secured to the substructure and spaced away from it and thereby are readily dismantlably secured together at the sides thereof or spaced apart a spacing distance by a first series of spaced apart concealed fastener clips appended to said first panel and to the substructure and a second series of spaced apart concealed fastener clips appended to said second panel and so located as to contact and hold to corresponding fastener clips of the first series, with the fasteners of the first series of clips being made from sheet or strip material and comprising a substantially coplanar and directly continuous spacing base portion which includes, spaced apart, a substructure contacting surface and a panel contacting surface, spaced apart by intermediate strengthening walls, which spacing base portion spaces the major back panel surface from said substructure when such fastener is installed, a web portion extending at about a right angle from said base portion, tab means extending from the web portion and suitable for entering the side of the panel to which the clip is to be appended, with the panel contacting surface of the base portion contacting the major back surface of a panel and with the web contacting a side thereof, and means for readily removably engaging with a complementary fastener clip which is attachable to another wallboard panel at a side thereof to hold the panels together in alignment and to allow easily effected dismantling of the wall by easy separation of the fasteners, when desired, while the fasteners remain fastened to the respective wallboard panels, and, held to the second wallboard panel, in locations thereon such that they fit the fasteners of the first series when the panels are assembled to form a wall or a portion of a wall, a second series of complementary clip fasteners comprising a substantially coplanar and directly continuous base portion, a web portion extending at about at right angle from said base portion, tab means extending from the web portion and suitable for entering the side of a panel to which the clip is to be appended, and means for readily removably fitting with the engaging means on the matching clips held to the first panel and for readily removably engaging with them to hold the wallboard panels together and in alignment and to allow easily effected dismantling of the wall by easy separation of the fasteners, when desired, while they remain fastened to the respective wallboard panels.

4,467,579

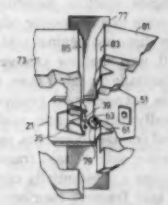
READILY SEPARABLE POSITIVELY LOCKING PANEL FASTENERS

Roger N. Weinar, 19 Parkside Ave., Hamburg, N.Y. 14075

Continuation-in-part of Ser. No. 314,771, Oct. 26, 1981,. This application Oct. 3, 1983, Ser. No. 538,110

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—281 **20 Claims**



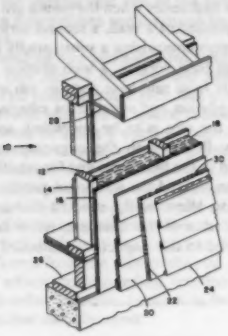
1. A mounting means for holding wall panels together in readily separable positively locking relationship, and for holding them to a framing member which comprises a pair of different panel fasteners, each adapted to be held to wall panels at sides thereof by insertion of portion(s) of such fasteners into such sides, one such fastener being adapted for fastening to a framing member onto which the panels are to be held, such fastener comprising a catch member which, when the fastener is installed on a first wallboard panel, is next to a side of such panel and between it and an abutting side of a second panel, and the other fastener, which is installable on such second panel at the abutting side thereof, comprising a latch member adapted to be held by the catch member, which catch member and which latch member are of such construction that when the first panel, containing a plurality of the fasteners spaced apart and with the catch members at a side thereof, is held to a framing member, and the second panel, containing a plurality of the fasteners matchingly spaced apart, with the latch members at an abutting side thereof, is pressed against the framing member in abutting sides relationship with the first panel, the latch members will snap into place, engaged by the catch member and will positively hold the second panel to the framing member, in such relationship that the panels, when so held, are disengageable by insertion of a blade between them and between the engaged fasteners to release the second panel from the first panel and from the framing member.

4,467,580

VENTED INSULATION SYSTEM

Gerard T. Sowinski, Lancaster, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Aug. 17, 1982, Ser. No. 408,909
Int. Cl.³ E04B 1/70
U.S. Cl. 52—302 **3 Claims**



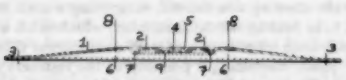
1. An insulated, exterior, vertical building wall comprising substantially moisture-impermeable, substantially flat boards mounted adjacent the exterior surface of said wall forming a substantially unbroken layer within said wall, said moisture-impermeable boards each having an inwardly directed side disposed firmly against inwardly disposed elements of said wall, said moisture-impermeable board having a plurality of spaced parallel elongate shallow moisture venting grooves extending from one edge to an opposite edge on only said one side thereof which is disposed against said inwardly disposed elements of said wall, said shallow grooves having a spacing between them substantially greater than the groove widths with ungrooved areas between said grooves forming a major portion of said inwardly directed side, said wall further comprising spaced vertical framing members, interior face forming members on the interior side of said framing members, relatively old siding forming a substantially continuous surface on the exterior side of said framing members, said substantially moisture-impermeable boards mounted externally of and against said relatively old siding, and relatively new siding applied over said moisture-impermeable boards.

4,467,581

MEMBRANE ANCHOR SYSTEM WITH METAL BODY

Thomas F. Francovitch, Columbia, Md., assignor to Single-Ply Institute of America, Inc., Columbia, Md.

Filed Feb. 24, 1982, Ser. No. 352,061
Int. Cl.³ E04D 3/36; E04B 7/00
U.S. Cl. 52—410 **13 Claims**



1. In a membrane anchor system in which a roof substrate is covered with a membrane of water impervious material anchored by linear fasteners which penetrate the membrane and are secured to underlying roof structure, a resilient thin disc-like body for engaging said membrane having upper and lower surfaces, said body having an unstressed state and being deformable to a stressed state under load imposed by the linear fastener, and comprising:

(a) a central, substantially planar region,

(b) an opening through said body in said central region for a linear fastener,

(c) means defining a downwardly facing cavity above said membrane outwardly of and surrounding said central region and said opening, said means in part extending above said central region thereby defining in the upper surface a recess above said central region,

(d) means defining a groove in surrounding relationship to said cavity defining means,

(e) an intermediate region extending outwardly of said groove and having an outer boundary, a peripherally entending flexure zone in said body at said outer boundary,

(f) an outer engaging region in surrounding relation to said flexure zone and located at a level below the bottom surface of said groove in the unstressed state of said body, said outer engaging region engaging said membrane in the stressed state of said body,

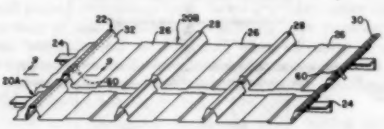
(g) said intermediate region defining therebeneath a mastic overflow cavity outwardly of said groove, and having a bending zone at its inner boundary.

4,467,582

JOINT RETENTION CLIP FOR RIB-LIKE PANEL JOINT

James G. Hague, Mars, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 426,703
Int. Cl.³ E04D 3/362, 3/38
U.S. Cl. 52—478 **10 Claims**



5. In a rib-like joint formed by a male partial rib and a female partial rib of adjacent panel members and wherein said panel members extend transversely across spaced-apart panel supports, the combination comprising:

said female partial rib comprising an outer crest, first and second outer sidewalls, one depending from each edge of said outer crest, the second outer sidewall terminating in an arcuate hug edge, and a first inturned base portion connecting the first outer sidewall to a panel web of one of said panel members;

said male partial rib comprising an upper portion adjacent to said outer crest, an inner sidewall depending from one edge of said upper portion downwardly into engagement with the second outer sidewall, and a second inturned base portion connecting said inner sidewall to a panel web of the other of said panel members;

at least one joint retention clip provided in the region between adjacent ones of said panel supports, said clip including clipping means embracing said upper portion and retaining said clip thereon, and downwardly divergent wing members elastically urged away from one another into engagement with an interior surface of said inner sidewall of said male partial rib and an interior surface of the outer sidewall of said female partial rib; and

a bead of sealant material compressed between confronting interior surfaces of said female partial rib and said upper portion;

said joint retention clip residing entirely on the protected side of said bead of sealant material.

4,467,583

REINFORCEMENT BASKET FOR REINFORCED-CONCRETE COLUMN

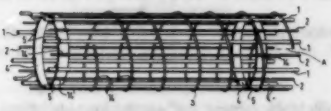
Wilhelm Hasak, Pfettrach, Fed. Rep. of Germany, assignor to Landshüter Baueisenbiegerei GMBH, Altdorf, Fed. Rep. of Germany

Division of Ser. No. 190,170, Sep. 23, 1980, Pat. No. 4,377,928. This application Aug. 24, 1982, Ser. No. 411,110

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1980, 3000605

Int. Cl.³ E04C 5/06

U.S. Cl. 52—653 11 Claims



1. A reinforced-concrete column reinforcement comprising:

two generally cylindrical weldable-steel complete hoops centered on and spaced apart along an axis and each having a generally cylindrical outer surface centered on the hoop axis;

a plurality of weldable-steel deformable holders welded at angular spacings on said hoops;

respective rigid longitudinal reinforcement bars each extending axially through a respective one of said holders of one of said hoops and through a respective one of said holders of the other of said hoops, said holders gripping said bars, holding said bars against said outer surfaces, and forming said bars and hoops into a rigid assembly; and

a helicoidal wrapping wire generally centered on said axis, fixed to said hoops, and surrounding said bars.

4,467,584

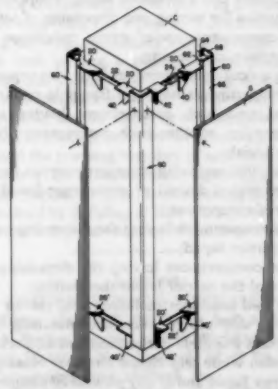
METHOD AND APPARATUS FOR ATTACHING FURRING TO COLUMNS

Robert C. Crites, P.O. Box 513, Euless, Tex. 76039, and Wilbur R. Youngs, Allen, Tex., assignors to Robert C. Crites, Euless, Tex., a part interest

Filed Mar. 8, 1982, Ser. No. 355,703

Int. Cl.³ E04C 3/30

U.S. Cl. 52—727 14 Claims



1. A system for attaching furring to a column comprising:

a corner clip with a first portion having a pair of spaced notches therein and a second portion extending from the first portion at an angle thereto;

a band for encircling the column and banding the clips to the column at spaced distances along the column, said band engaging the second portion of said clips to the column; and

a corner angle for engagement into the notches in at least two of said clips spaced along the column, said corner angles serving to receive fasteners therein for holding furring thereto to cover the column.

4,467,585

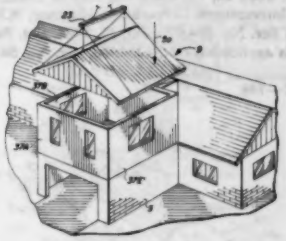
METHOD AND APPARATUS FOR CONSTRUCTION SECOND STORY ADDITIONS TO PRE-EXISTING RESIDENTIAL STRUCTURES

Richard D. Busby, 3133 E. Onyx, Phoenix, Ariz. 85028

Filed May 25, 1982, Ser. No. 381,895

Int. Cl.³ E04G 23/06

U.S. Cl. 52—741 6 Claims



1. A method for making a second story addition on a pre-existing residence, said method comprising the steps of:

(a) severing a first roof section that includes a finished ceiling from the remaining portion of the roof of said residence and also severing said first roof section from the walls of a first section of said residence;

(b) installing peak spanner means inside said first roof section for distributing lifting forces to at least most of the trusses or rafters of said first roof section and installing a plurality of tension elements to transmit lifting forces from respective ones of a plurality of cables to said peak spanner means, said peak spanner means including an elongated bar having a cross-sectional shape of an inverted V with an angle that matches the angle between truss chords of said first roof section, said peak spanner means including a plurality of tabs for supporting said elongated bar, said installing of said peak spanner means including pressing said elongated bar upward against the inner peak portion of said first roof section and nailing or otherwise attaching said tabs to truss chords of said first roof section, said method including drilling holes through the peak portion of said roof, extending said tension elements through said holes and attaching them to said spanner means;

(c) connecting a plurality of cables supported by a crane to said tension elements and to a plurality of lift points of said roof substantially spaced from the peak of said first roof section;

(d) operating said crane to lift said first roof section away from said residence and put said first roof section on the ground near said residence, said remaining portion of said roof and the walls of said residence all remaining in place;

(e) connecting a plurality of cables supported by said crane to a pre-constructed floor section at a plurality of lift points, respectively, of said pre-constructed floor section;

(f) operating said crane to lift said pre-constructed floor section, align it with said walls of said first section of said residence, and placing said preconstructed floor section on said walls;

(g) operating said crane to lift a plurality of pre-constructed walls sections with said pre-constructed floor section, and

attaching said pre-constructed wall sections to said pre-constructed floor section;

(h) repeating step (c) to connect the plurality of cables to said first roof section on the ground; and

(i) operating said crane to lift said first roof section, aligning it with the tops of said wall sections, placing said first roof section on the tops of said wall sections, and attaching it to said wall sections,

whereby said first roof section can be removed from said residence, said preconstructed floor section and said pre-constructed wall sections can be installed on said residence and said first roof section can be re-installed on said residence, within a single day.

4,467,586

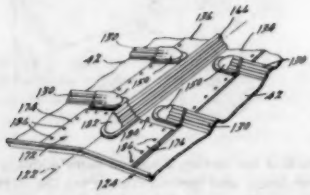
ROOF RIDGE STRUCTURE AND SYSTEM

Gene M. Long, Houston, Tex.; Terry E. DeWitt, Memphis, and Bell, III: John R., Germantown, both of Tenn., assignors to AMCA International Corporation, Hanover, N.H.

Division of Ser. No. 284,970, Jul. 20, 1981, Pat. No. 4,420,913. This application Oct. 12, 1983, Ser. No. 541,078

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—748 **18 Claims**



1. A method for enclosing the ridge of a building roof, said building roof having at least two surfaces covered with raised rib seam roofing panels whereby said raised rib seams may be of non-uniform height and spacing, said method comprising:

connecting a first ridge panel section to one of the roof surfaces, said first ridge panel section having a plurality of notches corresponding to the raised rib seams along said surface,

connecting a second ridge panel section to another of the roof surfaces, said second ridge panel section having a plurality of notches corresponding to the raised rib seams along said surface,

interlocking said first and second ridge panel sections together to form a raised rib seam substantially along the ridge line of said roof, and

positioning a plurality of cap means on said first and second ridge panel sections, each of said cap means covering one of said notches and an end of said raised rib seams of said roofing panels.

4,467,587

COMPONENT TO BE EMPLOYED IN THE CONSTRUCTIION OF WALLS POURED IN THE GROUND, WALL INCORPORATING SUCH A COMPONENT, AND METHOD OF CONSTRUCTING SUCH A WALL

Jean-Daniel Montagnan, Rueil Malmaison, France, assignor to Soletanche, Nanterre, France

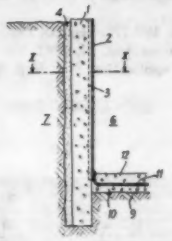
Filed Jun. 10, 1982, Ser. No. 387,003

Claims priority, application France, May 14, 1982, 82 08465

Int. Cl.³ E04G *21/00*; E02D *5/20*

U.S. Cl. 52—169.14 **2 Claims**

1. A method of constructing an impermeable wall cast in the ground, comprising the steps of digging in the ground a trench having an excavation side and a ground side, positioning in the trench next to each other at least two prefabricated concrete components having each a sheet of impermeable material that covers fully one side of said component, with said sheet positioned on the excavation side of the trench, said sheet having its side opposite to said excavation side comprising projections cast into said concrete component, fixing said components in



said trench, excavating said excavation side of the trench to expose said impermeable sheets, and interconnecting impermeably said impermeable sheets of two adjacent components.

4,467,588

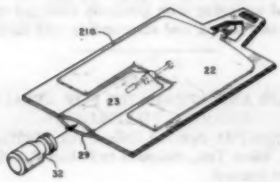
SEPARATED PACKAGING AND STERILE PROCESSING FOR LIQUID-POWDER MIXING

Peter Carveth, Glen Ellyn, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 6, 1982, Ser. No. 365,944

Int. Cl.³ B65B *3/04, 55/04, 55/22*

U.S. Cl. 53—425 **14 Claims**



1. A process for producing an integral aseptic container for separately storing, mixing, and dispensing a sterilized powdered component and a sterilized liquid component in a manner that provides for mixing and dispensing of said powdered and liquid components under sterile conditions within said integral container, comprising:

providing a container having at least two separate and distinct compartments having a frangible connection therebetween, one such compartment having a dispensing outlet portion, another such compartment being for receiving a vial;

sealing the vial-receiving compartment to form a closed chamber that is devoid of any carrier-liquid and of any powdered component;

filling the compartment having the dispensing outlet portion with a carrier liquid;

sealing the compartment having the dispensing outlet portion to seal the carrier liquid therewithin;

sterilizing said container including said carrier liquid compartment, said closed chamber, including the interior thereof said frangible connection and said sealed dispensing portion while said closed chamber remains devoid of any carrier liquid and of any powdered component during said sterilizing step;

opening, subsequent to said sterilizing step, an end of said closed chamber of the sterilized container while said container is within an aseptic environment;

inserting a sealed vial into the chamber through the end that was opened during said opening step and while said con-

tainer is within an aseptic environment, said vial containing a sterilized powdered component therewithin, said inserting step including positioning the sealed vial such that, when its seal is broken, the powdered component will enter into said frangible connection between the carrier liquid compartment and said chamber; and

sealing, subsequent to said inserting step, said open end of said chamber while said container is within an aseptic environment, thereby sealing the vial within said chamber.

4,467,589

METHOD AND APPARATUS FOR SPLICING PACKING MATERIAL WEBS

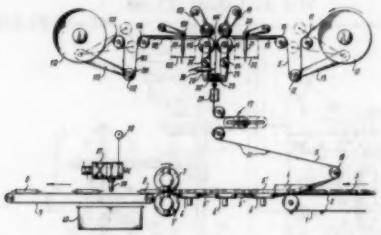
Johannes D. van Maanen, Berkel En Rodenrijs, Netherlands, assignor to Tevopharm-Schiedam B.V., Schiedam, Netherlands

Filed Dec. 8, 1981, Ser. No. 328,513

Claims priority, application Netherlands, Mar. 31, 1981, 8101588

Int. Cl.³ B65B *41/16, 41/18*

U.S. Cl. 53—450 **11 Claims**



1. A method of splicing a trailing end portion of an advancing web of packing material to a leading end portion of an initially stationary second web of packing material such that after splicing, marks provided on each of the webs in an equally spaced relation continue as an uninterrupted regular row, in a packing machine, said method comprising the steps of: running the first web over a roller, placing the leading end portion provided with an adhesive of the second web over a second roller opposite to the first roller, exciting an initiating signal upon the trailing end of the first web passing a predetermined point, supplying the signal to a controlling device for conditioning the same, generating a second signal upon a mark on the first web passing a predetermined point, by which second signal the conditioned controlling device delivers a command to a displacing device for pressing said rollers against each other and for carrying out the splicing, determining the period of time (t) between the actuation of the displacing device and the pressing together of said rollers, and setting a lapse of time (Tn−t) between the signal generated by said mark and the command from the controlling device, Tn being the time obtained by dividing at least one spacing between two subsequent marks by the velocity of the first web.

4,467,590

DRIVE REVERSING MECHANISM

Glenn A. Musser; James W. McDuffie, both of New Holland; Richard A. Pucher, Leola; Lloyd W. Redding, Lancaster, and T. William Waldrop, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Dec. 12, 1983, Ser. No. 560,650

Int. Cl.³ A01D *69/08*

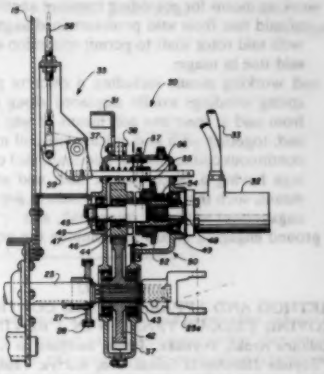
U.S. Cl. 56—11.2 **25 Claims**

1. A drive reversing mechanism for a crop harvesting machine having a base power unit, a crop harvesting attachment mounted on the base unit, and a drive line, including a rotatable drive shaft, operatively interconnecting the base unit and the attachment for powering the operation thereof, comprising:

a casing having first opening therethrough, said casing being positionable such that said drive shaft passes through said first opening;

a first power transfer means rotatably mounting within said casing and affixed to said drive shaft to be rotatable therewith in a normal direction of rotation;

a second power transfer means rotatably mounted within



said casing in operative communication with said first power transfer means to be rotatable therewith;

power means mounted on said casing for providing a source of rotational power in a reverse direction of rotation opposite to said normal direction of rotation; and

clutching means interconnecting said second power transfer means and said power means for selectively operatively engaging said power means with said second power transfer means to effect a rotation of said first power transfer means and said drive shaft in said reverse direction.

4,467,591

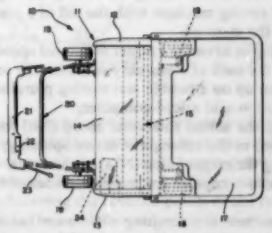
ROTOR COMB CONSTRUCTION FOR POWER LAWN RAKE AND METHOD OF ASSEMBLY THEREFOR

Ernest R. Dynie, Brockville, Canada, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 9, 1982, Ser. No. 416,144

Int. Cl.³ A01D *7/06*

U.S. Cl. 56—16.4 **1 Claim**



1. A rotor comb construction for a power lawn rake, comprising in combination a tubular rotor shaft, the shaft having a plurality of axially spaced radial holes formed in a uniform helical formation therein, and a corresponding plurality of axially stacked tines mounted on the shaft, each tine including:

retaining means having at least one coil means for constantly

providing a complete 360° frictional engagement of said rotor shaft;

said retaining means engaging soley said rotor shaft;

keying means for keying said tine to said shaft in a predetermined angular relationship and for preventing permanent angular displacement of said tine from said predetermined angular relationship with said rotor shaft;

said keying means consisting essentially of an inturned end portion of said one coil means being radially engaged in a respective rotor shaft hole;

working means for providing transient angular displacement of said tine from said predetermined angular relationship with said rotor shaft to permit retraction and flexibility of said tine in usage;

said working means including a discrete plurality of coil spring windings axially displaced along said rotor shaft from said at least one coil means of said retaining means and, together with said at least one coil means, forming a continuous coil encircling said shaft, said coil spring windings having a larger radius than said at least one coil means, such that said spring windings are normally out of engagement with said rotor shaft; and

ground engaging means for combing the ground.

4,467,592

METHOD AND APPARATUS FOR CONTROLLING THE ROVING TAKE-UP TENSION IN A ROVING MACHINE

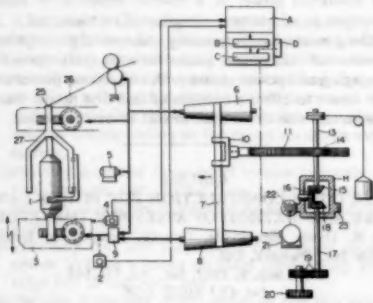
Hidejiro Araki, Toyoake, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sep. 29, 1982, Ser. No. 427,189

Claims priority, application Japan, Oct. 12, 1981, 56-162219

Int. Cl.³ D01H *1/26*

U.S. Cl. 57—96 **9 Claims**



1. A method for controlling the roving take-up tension in a bobbin lead roving machine with the aid of a microcomputer, comprising the steps of:

determining in advance a target rotational speed (N°n) of the bobbin for each of a plurality of arbitrarily selected layers (n) taken up on a bobbin and storing plural sample sets of (N°n)-(n) in said micro-computer;

measuring the actual rotational speed (Nn) for each of the layers (n) in the subsequent actual spinning;

comparing the target value (N°n) to the actual value (Nn) in said micro-computer for respective ones of the layers (n); and

issuing, in case the resulting difference has exceeded the preset control limit value, a signal for correcting the actual rotational speed (Nn) towards said target rotational speed, thereby to speed up or slow down the bobbin rotation for automatically compensating the take-up tension on the roving.

2. An apparatus for controlling the roving take-up tension in a bobbin lead roving machine, said apparatus comprising:

a sensor for measuring the rotational speed of a bobbin;

means for counting the number of layers of the roving;

a micro-computer designed to receive and count outputs from said sensor and said counting means to compare said outputs with the values of the rotational speed of the bobbin related to preset ones of the roving layers, said micro-computer issuing a compensation signal when the result of such comparison has exceeded a preset control limit value;

relaying means operable in response to said compensation signal; and

means responsive to actuation of said relaying means to change the rotational speed of the bobbin.

4,467,593

METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING WINDING TENSION OF A ROVING IN A ROVING MACHINE

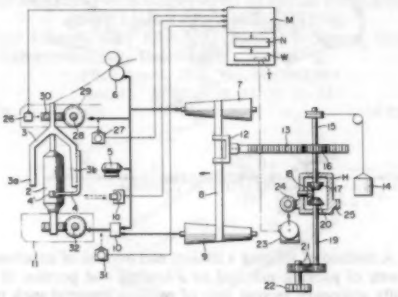
Hidejiro Araki, Toyoake, Japan, assignor to Seisakusho Kabushiki Kaisha Toyoda Jidoshokki, Kariya, Japan

Filed Oct. 6, 1982, Ser. No. 432,988

Claims priority, application Japan, Oct. 9, 1981, 56-161472

Int. Cl.³ D01H *1/26*

U.S. Cl. 57—96 **10 Claims**



1. A method for automatically controlling the winding tension of a roving in a bobbin lead roving machine with the aid of a micro-computer, said method comprising the steps of:

measuring the mean bobbin winding diameter (D_B) for a given operating spindle of the machine;

measuring the bobbin rational speed (N_B) for said operating spindle;

measuring the rotational speed (N_F) of the flyer associated with said operating spindle;

calculating in said micro-computer a value (K) given by equation

$$K = \left(\frac{NB}{N_F} - 1 \right) \times D_B$$

representative of the winding condition for the roving and based on said measured values;

comparing in said micro-computer said calculated value (K) with a predetermined optimum value (K_O) of said roving condition; and

adjusting the bobbin rotational speed when the difference between said value (K) and said optimum value (K_O) exceeds a preset control limit (δK) thereby automatically controlling winding tension of the roving.

2. An apparatus for automatically controlling the winding tension of a roving in a bobbin lead roving machine, said apparatus comprising:

a non-contact distance measurement device adapted for measuring a bobbin diameter (D_B) for one or more operating spindles;

a sensor for measuring a bobbin rotational speed (D_B);
a sensor for measuring a flyer rotational speed (N_F);
a micro-computer operative to calculate a value (K) given by the equation $K=(N_B/N_F-1)\times D_B$ representative of the winding condition for the roving, to compare the resultant value (K) with preset control limits therefor and to issue a corresponding correction signal when the value (K has exceeded said control limits;
relay means operable by said correction signal; and
means responsive to the operation of said relay means for changing the bobbin rotational speed, thereby to obtain the optimum winding tension of the roving.

4,467,594

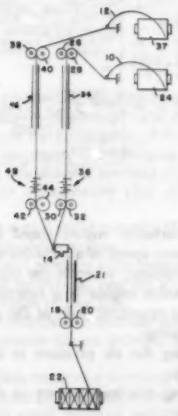
SPUN-LIKE TEXTURED YARN

Paul W. Eschenbach, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 240,732, Mar. 5, 1981, abandoned. This application Jan. 3, 1983, Ser. No. 455,074

Int. Cl.³ D02G *1/16, 3/34*

U.S. Cl. 57—207 **3 Claims**



1. A process of making an air textured yarn having a core yarn and effect yarn comprising the steps of: supplying a first partially oriented yarn at a first feed rate, supplying a second partially oriented yarn at a second feed rate, heating the first and second yarns after supplying at their respective first and second feed rates, drawing the first yarn at a third feed rate after heating, drawing the second yarn at a fourth feed rate after heating, supplying the drawn first and second yarns into an air jet, means supplying gaseous fluid at a pressure equal to or greater than 100 p.s.i.g. into the air jet to commingle and texture the first and second yarns by causing the second yarn to form crunodal loops which project through the filaments of the first yarn and are twisted at the base thereof to hold the first and second yarns together and withdrawing the commingled spun-like yarn from the air jet at a third rate which is greater than the first and second feeds but less than the third and fourth feed rates.

3. A commingled, textured yarn comprising a multi-filament, synthetic continuous filament core yarn commingled by air jet with a multi-filament, synthetic continuous filament effect yarn which has crunodal loops therein which project between filaments of the core yarn and twisted at the base thereof to hold the core and effect yarns together.

4,467,595

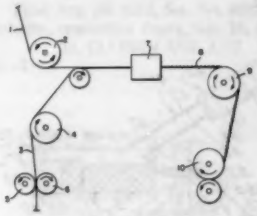
LATENT CONTRACTABLE ELASTOMERS, COMPOSITE YARNS THEREFROM AND METHODS OF FORMATION AND USE

Aloysius A. J. Kramers, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 313,927, Oct. 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 178,661, Aug. 18, 1980, abandoned. This application Sep. 14, 1983, Ser. No. 532,338

Int. Cl.³ D02G *3/02*

U.S. Cl. 57—225 **14 Claims**



1. A latent contractable melt extruded segmented, inherently elastic polyester-polyester or polyester-polyether thermoplastic polymer filament characterized by containing interspersed relatively hard segments and relatively soft segments, which contracts at least 15% in length when subjected to an elevated temperature, as compared to the length of the melt extruded filament without deliberate drawing prior to contraction to yield an elastic filament.

4,467,596

SZ TWISTING DEVICE FOR ELEMENTS OF ELECTRIC CABLES AND LINES TO BE TWISTED

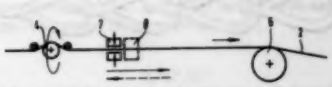
Wolfgang Feese, Neustadt, and Dieter Vogelsberg, Coburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 446,874

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3149159

Int. Cl.³ H01B *13/04*

U.S. Cl. 57—293 **10 Claims**



1. In an SZ twisting device for elements of electric cables and lines to be twisted comprising at least one rotating twisting tool which is fixed at the exit of the twisting device, a stationary torsion stopper following the rotating twisting tool, and a device for influencing the reversal points of the twist direction in the material to be twisted arranged between the twisting tool and the torsion stopper, the improvement comprising:

(a) the device for influencing the reversal points comprising clamping tongs which grip the elements to be twisted sectionally, said clamping tongs supported for movement back and forth in the direction of travel of the material to be twisted; and

(b) means associated with said clamping tongs for joining the elements to be twisted to each other.

4,467,597
METHOD OF SPINNING A YARN FROM TWO TYPES OF STABLE FIBERS

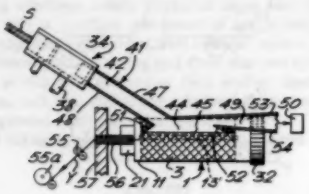
Alan Parker, Bolton, and William M. Farnhill, Burnley, both of England, assignors to Platt Saco Lowell Corporation, Greenville, S.C.

Continuation-in-part of Ser. No. 324,465, Nov. 24, 1981, Pat. No. 4,399,650, which is a continuation-in-part of Ser. No. 88,262, Oct. 25, 1979, Pat. No. 4,315,398. This application Jul. 16, 1982, Ser. No. 399,099

Claims priority, application United Kingdom, Jul. 25, 1981, 8123030

Int. Cl.³ D01H 7/892, 1/12

U.S. Cl. 57—401 8 Claims



1. In a process for spinning a yarn from different types of fibers, by separating the fibers into discrete fibers, feeding them for conveyance to an elongate zone of yarn formation, moving the fibers to said zone and depositing them therat, twisting the fibers to form said yarn, and withdrawing said yarn from said zone, the improvement comprising

a. orienting said discrete fibers during said separating, feeding, moving, and depositing concurrently and continuously to provide a continuum of said fiber types, from one fiber type to overlapping admixtures of the two fiber types and to the other fiber type, and

b. concurrently and continuously depositing and twisting said fibers at said zone of yarn formation as said continuum extending from one end of said zone to the other end of said zone whereat said twisted yarn is withdrawn.

4,467,598
ENERGY ABSORBING TRAILER CHAIN

William M. Wells, 104 Greenbriar La., Oak Ridge, Tenn. 37830

Filed Apr. 28, 1981, Ser. No. 258,389

Int. Cl.³ F16G 13/00

U.S. Cl. 59—78 13 Claims

1. A safety chain system having energy absorbing characteristics for use with a towing vehicle and a towed vehicle combination having a releasable coupling suitable for moving said towed vehicle along a roadway with said towing vehicle, said safety chain system comprising:

a length of safety chain detachably connectable between such towing vehicle and such towed vehicle, said length of safety chain comprising a plurality of serially inter-connected links, each link being a closed loop having a first end and a further end and being provided with a rotational twist from said first end to said further end, said links being fabricated of an unhardened low carbon steel characterized by sufficient ductility such that when sufficient tensional forces are applied through said safety chain, said links permanently deform by untwisting and elongating as said safety chain system absorbs the energy, and said plurality of interconnected links including a first group of links having said rotational twist in a first selected direction and a second group of links having a twist in a second direction which is opposite said first selected direction such that untwisting of a link in said first group is compensated by untwisting of a link in said second group, the total elongation of said links of said safety chain system comprising elongation due to untwisting of said links in addition to the elongation possible due to said ductility of said unhardened low carbon steel.

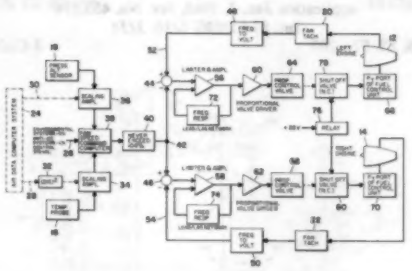
4,467,599
TURBORAN SPEED LIMITING CONTROL SYSTEM

M. Samuel Moore, Northridge, Calif., assignor to Semco Instruments, Inc., North Hollywood, Calif.

Filed Dec. 28, 1981, Ser. No. 334,552

Int. Cl.³ F02C 7/047, 9/28

U.S. Cl. 60—39.093 13 Claims



1. An aircraft turbofan engine speed control system for limiting the maximum speed of a turbofan engine having associated anti-ice equipment, wherein the maximum permissible speed for the turbofan engine is a function of temperature, pressure and of the operating state of the anti-ice equipment, said system comprising:

means for sensing the air pressure in the vicinity of the turbofan engine;

means for sensing the temperature in the vicinity of the turbofan engine;

means for measuring the speed of rotation of the fan section of said engine;

means for providing an output signal indicating whether the anti-ice equipment is in operation;

circuit means for determining a maximum allowable fan speed which increases with increasing temperature at lower temperature ranges; means for increasing the maximum allowable fan speed with increasing altitude and reduced pressure; means for reducing the maximum allowable fan speed with increasing temperature at higher temperature levels; and means for limiting the allowable fan speed to a predetermined maximum absolute limit, regardless of temperature and pressure; to thereby determine a composite maximum allowable fan speed;

means for providing an alternative composite maximum allowable fan speeds depending on whether said anti-ice equipment is in operation or not;

switching means for selecting one of said two composite maximum allowable fan speeds depending on the state of operation of the anti-ice equipment; and

means for comparing the actual turbine fan speed with the selected composite maximum allowable fan speed and for limiting the actual speed to the vicinity of said selected maximum allowable speed.

4,467,600

SYSTEM FOR CONTROLLING THE THRUST NOZZLE ADJUSTMENT OF DUAL CYCLE GAS TURBINE JET PROPULSION ENGINES

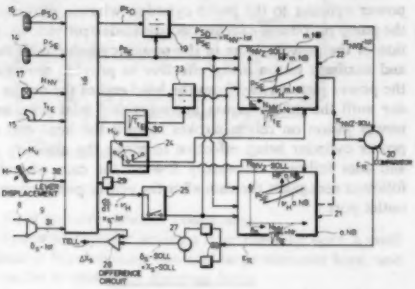
Jürgen Pelkert, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 171,258, Jul. 22, 1980,. This application May 23, 1983, Ser. No. 496,336

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1979, 2930956

Int. Cl.³ F02K *1/18*

U.S. Cl. 60—204 3 Claims



1. A method for controlling dual cycle gas turbine jet propulsion engines by means of pressure ratio closed loop control circuit which controls the adjustment of the opening angle of the thrust nozzle, comprising the following steps:

(a) measuring the actual static pressure (P_{sD}) downstream of the radial outer compressore (1*a*) of the second flow circuit (K2),

(b) measuring the actual static pressure (P_{sE}) of the air flowing into the propulsion engine,

(c) forming an actual pressure ratio between the actual pressures measured insteps (a) and (b) to provide an actual pressure ratio value ($\pi_{NVZ\text{-}IsT}$),

(d) measuring the reduced revolutions per minute of the low pressure compressor (1) to provide a respective r.p.m. value (N_r),

(e) storing in a first computor memory (21) rated pressure ratio values ($\pi_{NVZ\text{-}Soll}$) as a function of said reduced r.p.m. value (N_r) said rated pressure ratio values in said first computer memory taking into account as parameters steady state operating conditions without afterburning and acceleration state operating conditions without afterburning,

(f) storing in a second computer memory (22) rated pressure ratio values ($\pi_{NVZ\text{-}Soll}$) as a function of said r.p.m. value (N_r), said rated pressure ratio values taking into account as parameters steady state operating conditions with afterburning and acceleration state operating conditions with afterburning,

(g) providing to said computer memories a second signal for activating one or the other of the two memories depending on the on or off condition of an afterburner,

(h) providing to said computer memories a first signal for activating one or the other of the two memories depending on the steady state operating condition parameter or the acceleration state operating condition parameter, and

(i) comparing under the control of said first and second signals one of said stored rated pressure ratio functions with the actual pressure ratio value formed in step (c) from values measured insteps (a), (b) under corresponding operating conditions to determine a control deviation ($\epsilon\pi$), and controlling said thrust nozzle adjustment angle in response to said control deviation to return the control deviation substantially to a zero value under said operating conditions, whereby during steady state operation fuel consumption is minimized in the subsonic range while the thrust is maximized in the supersonic range, and whereby during the non-steady state of operation the stability between the two aerodynamic limits of the compressor surging on the one hand and of the afterburner chamber quenching on the other hand is assured.

4,467,601

METHOD AND A SYSTEM FOR CONTROLLING A SOOT CATCHER PURGING THROTTLE VALVE

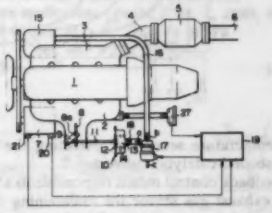
Noboru Watanabe, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 20, 1982, Ser. No. 409,835

Claims priority, application Japan, Sep. 18, 1981, 56-148277

Int. Cl.³ F01N *3/02, 3/22*

U.S. Cl. 60—274 3 Claims



1. In a diesel internal combustion engine including an exhaust system having a soot particle catcher, an intake manifold and an air throttle valve positioned in said intake manifold for throttling the flow of air through said manifold and for raising the temperature of exhaust gases flowing through said exhaust system to purge said soot particle catcher by incineration, a method comprising repeatedly performing the steps of:

measuring engine load;

measuring engine revolution speed;

determining, based upon the measured engine load and revolution speed, when the engine is operating in a first operational condition which allows for intake throttling for purging of said soot particle catcher and when said engine is operating in a second operating condition which does not allow for intake throttling for purging of said soot particle catcher;

measuring the pressure in said intake manifold at a point downstream of said intake throttle valve;

only when said engine is operating in said first operating condition, controlling the opening of said throttle valve as a function of said measured pressure so as to bring the pressure measured at said point in said intake manifold to a predetermined target pressure value.

4,467,602

SPLIT ENGINE CONTROL SYSTEM

Haruhiko Iizuka, Yokosuka, and Fukashi Sugasawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 25, 1982, Ser. No. 436,517

Claims priority, application Japan, Oct. 28, 1981, 56-172376

Int. Cl.³ F01N *3/20*; F02D *17/00*

U.S. Cl. 60—276 6 Claims

1. A split engine control system, comprising:

(a) a plurality of cylinders separated into first and second cylinder groups;

(b) a split engine control means for operating said engine under light load conditions in a partial cylinder mode in which only said first cylinder group is activated and said second cylinder group is deactivated and allowed to pump air therethrough, and for operating said engine under

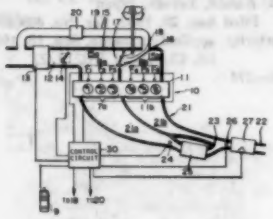
relatively heavy load conditions in a full cylinder mode in which said first and second groups are activated;

(c) first and second upstream exhaust passages for passing gases exhausted from said first and second cylinder groups, respectively, to a common junction;

(d) a common downstream exhaust passage connected to said common junction for passing said gases therethrough to the atmosphere;

(e) a first exhaust gas sensor and a first catalytic converter disposed in said first upstream exhaust passage;

(f) a second catalytic converter disposed in said common downstream exhaust passage;



(g) a temperature sensor for detecting the temperature of said second catalytic converter;

(h) a feedback control means responsive to a signal from said first exhaust gas sensor for maintaining the ratio of the air-fuel mixture supplied to said first cylinder group at the stoichiometric point; and

(i) a first means responsive to a signal from said temperature sensor for disabling said feedback control means and controlling the ratio of the air-fuel mixture supplied to said first cylinder group at a point which lies to the rich side of the stoichiometric point when the temperature of said second catalytic converter is below a predetermined level during the partial cylinder mode.

4,467,603

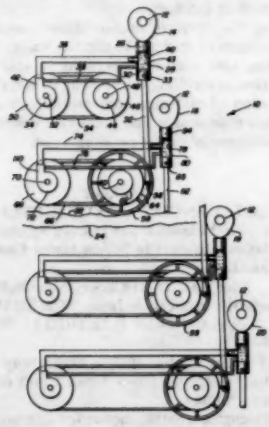
TORQUE TRANSFER APPARATUS

William L. Wilson, 14461 S.R. 104, Ashville, Ohio 43103

Filed Jul. 8, 1981, Ser. No. 281,483

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—369 **8 Claims**



1. A hydraulic power transfer apparatus comprising a power cylinder, a power piston mounted for reciprocation in the power cylinder, the power piston having a piston rod for connection to a power take off, an auxiliary piston mounted in a head end of the power cylinder in opposition to the power piston, the auxiliary piston having an exposed cam follower, a driven cam associated with the cam follower for moving the auxiliary piston in the power cylinder toward the power piston, a pump cylinder, a pump piston reciprocally mounted in the pump cylinder, drive means for providing reciprocation of the pump piston in the pump cylinder, a hydraulic fluid supply line extending from the pump cylinder to the power cylinder for supplying fluid under pressure from the pump cylinder to the power cylinder, said supply line communicating with an inlet port in the side of the power cylinder, and a delivery line extending from an outlet port in the side of the power cylinder to the pump cylinder for the return of hydraulic fluid from the power cylinder to the pump cylinder, wherein movements of the pump piston and cam are coordinated to provide reciprocation of the power piston in the power cylinder with the cam and auxiliary piston being effective to provide movement of the power piston away from the head end of the power cylinder until the power piston uncovers said inlet port, and the power piston on return strokes toward the head end of the power cylinder being effective to move the auxiliary piston and cam follower outwardly toward the cam whereby the follower reengages the cam after the power piston covers said outlet port.

4,467,604

HYDROSTATIC DRIVE SYSTEM FOR AN EXCAVATOR

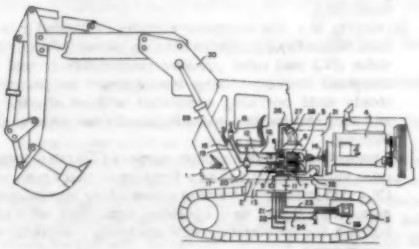
Franz Forster, Muhlbach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Hoilriegelskreuth, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 213,750

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952303

Int. Cl.³ B62D *11/04, 27/00*

U.S. Cl. 60—484 **5 Claims**



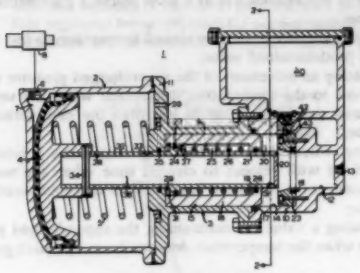
1. A hydrostatic drive system for an excavator having a primary energy source, comprising a common drive block, at least one pump in said drive block drivingly connected to said energy source, at least one control block on said drive block receiving fluid from said pump, rotary fluid coupling means connected to said dirve block receiving fluid from said at least one pump, at least one drive motor drivingly connected to said fluid coupling means, at least one hydraulic actuator drivingly connected to said at least one control block, connections within said drive block operatively connecting said at least one pump, said at least one control block and said fluid coupling and reservoir means connected to said drive block, providing fluid to said at least one pump.

4,467,605

HYDRO-PNEUMATIC ACTUATOR WITH AUTOMATIC SLACK ADJUSTER

Eric Smith, Burlington, Canada, assignor to WABCO Ltd., Hamilton, Canada

Filed Sep. 27, 1982, Ser. No. 425,026
Int. Cl.[3] F15B 7/04
U.S. Cl. 60—577 9 Claims



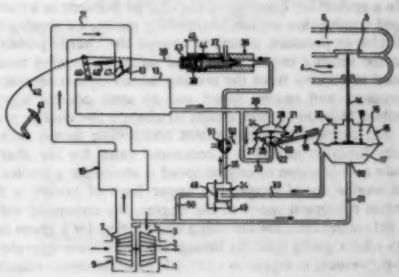
1. A fluid pressure actuator comprising:
(a) a hydraulic cylinder having a large diameter bore, a small diameter bore opening into said large diameter bore, and an outlet in said small diameter bore;
(b) a high-pressure piston operatively disposed in said large diameter bore and adapted to enter said small diameter bore;
(c) first seal means in said small diameter bore for engagement with said high-pressure piston;
(d) a low-pressure piston slidably mounted on said high-pressure piston for operation in said large diameter bore;
(e) second seal means in said large diameter bore engageable with said low-pressure piston for providing first and second hydraulic chambers on the opposite sides of said low- and high-pressure pistons;
(f) a reservoir in which hydraulic fluid is stored;
(g) a displacement cylinder;
(h) a displacement piston operable in said displacement cylinder between first and second positions, said displacement piston forming in cooperation therewith a third chamber on one side of said displacement piston and a fourth chamber on the other side;
(i) a first passage between said reservoir and said third chamber via which hydraulic fluid is communicated therebetween;
(j) a second passage between said second and fourth chambers via which hydraulic fluid is conducted in response to said joint movement of said high- and low-pressure pistons;
(k) stop means for defining said second position of said displacement piston, said displacement piston being movable from said first position to said second position in response to the flow of said hydraulic fluid from said fourth chamber to said second chamber during said actuation of said high- and low- pressure pistons said predetermined distance;
(l) a third passage between said third and fourth chambers via which make-up hydraulic fluid is drawn from said reservoir to said second chamber in response to actuation of said high-pressure piston a distance exceeding said predetermined distance following engagement of said displacement piston with said stop;
(m) a first one-way check valve in said third passage;
(n) a branch passage of said second passage leading to said first chamber; and
(o) a second one-way check valve in said branch passage via which said make-up hydraulic fluid drawn into said second chamber is conducted to said first chamber upon retraction of said high- and low-pressure pistons.

4,467,606

TURBO-COMPRESSOR SUPERCHARGER DEVICE FOR INTERNAL COMBUSTION ENGINE

Pierre Chaffiotte, Saint Cloud, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Dec. 1, 1981, Ser. No. 326,210
Claims priority, application France, Dec. 2, 1980, 80 25577; Jan. 20, 1981, 81 01004; May 5, 1981, 81 08929
Int. Cl.[3] F02B 37/00
U.S. Cl. 60—602 14 Claims



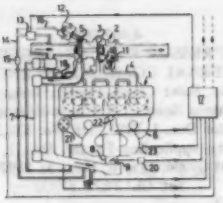
1. A turbo-compressor supercharging device for an internal combustion engine having an engine intake manifold, an engine exhaust manifold and an engine intake butterfly valve controlled by a butterfly control means having a maximum stroke exceeding a fully open position of said butterfly valve, said turbo-compressor supercharging device comprising:
a turbine driven by engine exhaust gases;
an air compressor driven by said turbine and connected to said engine intake manifold;
an exhaust gas waste gate associated with said exhaust manifold;
a valve control assembly connected to said waste gate for controlling a position of said waste gate, said valve control assembly including a first control portion and a second control portion, said valve control assembly being actuated by a pressure differential between said first and second control portions;
a pilot valve connected to a source of engine intake manifold pressure and responsive to a negative intake manifold pressure signal to supply said intake manifold pressure to said first control portion;
first conduit means supplying compressor output pressure to said second control portion; and
a vent valve connected by second conduit means to said second control portion for venting said second control portion to the atmosphere, said vent valve being actuatable in response to a butterfly control means stroke exceeding said fully open butterfly valve position,
whereby a position of said waste gate is controlled, when said butterfly control means stroke exceeds said fully open butterfly position, by a degree of said vent valve venting said second control portion.

4,467,607

SYSTEM FOR CONTROLLING THE INLET PRESSURE IN A TURBOCHARGED COMBUSTION ENGINE

Jan E. Rydquist, Billdal; Lars Sandberg, Gothenburg, and Ralf Wallin, Lindome, all of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Filed Feb. 16, 1982, Ser. No. 348,721
Claims priority, application Sweden, Feb. 19, 1981, 8101119
Int. Cl.³ F02B 37/12
U.S. Cl. 60—602 4 Claims



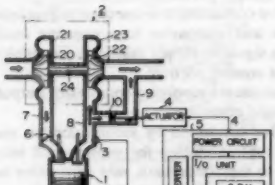
1. In a system for controlling the charge pressure in a turbocharged combustion engine, comprising means for sensing the actual charge pressure, means to change the charge pressure, means for sensing engine speed and signal processing means disposed to receive from the sensing means signals representing pressure and engine speed and to send control signals dependent thereon to said means to change the charge pressure, said signal processing means comprising means with a memory function in which a command value for the charge pressure as a function of engine speed is stored for a predetermined engine speed range, the upper limit of which is the maximum rotational speed of the engine, the command value lying below the limit for knocking combustion for a given fuel quality and a given ignition timing at steady state operation; the improvement comprising a throttle position sensor coupled to the signal processing means and emitting a signal representing the degree of opening of the throttle, said signal processing means correcting the stored command value with a correction factor dependent on the degree of opening of the throttle.

4,467,608

CONTROL METHOD AND APPARATUS FOR AN INTERNAL COMBUSTION ENGINE WITH A TURBOCHARGER

Ryuichi Matushiro, Okazaki; Koichi Moriguchi, Nagoya; Kenzi Iwamoto, Nishio; Hisasi Kawai, Toyohashi; Nobutaka Mizuno, and Yasuhiro Ikuta, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 7, 1982, Ser. No. 376,134
Claims priority, application Japan, May 8, 1981, 56-69961
Int. Cl.³ F02B 37/12
U.S. Cl. 60—602 3 Claims



1. A control method for an internal combustion engine equipped with a supercharger having a turbine in a turbine casing driven by exhaust gas and a compressor in a compressor casing connected to the turbine comprising the steps of:

compressing air by the compressor and supplying it to the engine;

sensing the temperature of the exhaust gas flowing into the turbine casing;

controlling the pressure of the supercharged air in response to the detected temperature so as to maintain the temperature of the exhaust gas at a level below a predetermined value,

deciding whether or not the sensed temperature is less than said predetermined value;

calculating an increment of the supercharged pressure with respect to the temperature differential when the sensed exhaust gas temperature is less than the predetermined value;

deciding whether or not the temperature has a positive gradient with respect to elapsed time when the sensed exhaust gas temperature is more than the predetermined value;

calculating a value for maintaining the supercharged pressure when the temperature does not have a positive gradient;

calculating a decrement of the supercharged pressure when the temperature has a positive gradient; and

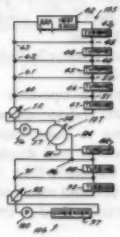
producing a supercharged pressure control signal for one of said calculation steps to control said supercharged pressure.

4,467,609

WORKING FLUIDS FOR ELECTRICAL GENERATING PLANTS

Robert G. Loomis, 116 Burdsall, Ft. Mitchell, Ky. 41017

Filed Aug. 27, 1982, Ser. No. 412,155
Int. Cl.³ F01K 25/08
U.S. Cl. 60—651 7 Claims



1. The method of converting heat energy to mechanical energy which comprises vaporizing a first fluid by passing said first fluid in a heat exchange relationship with a heat source and utilizing the kinetic energy of the resulting expanding vapors to perform work, wherein said first fluid is selected from the group consisting of molybdenum hexafluoride, tungsten pentachloride, tungsten hexachloride and tungsten hexafluoride.

4,467,610

GAS TURBINE FUEL SYSTEM

Carl E. Pearson, Swampscott, and Timothy J. Higgins, Arlington, both of Mass., assignors to General Electric Company, Lynn, Mass.

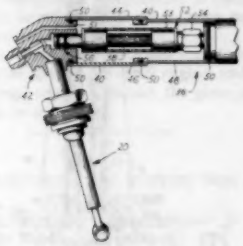
Filed Apr. 17, 1981, Ser. No. 255,191
Int. Cl.³ F02C 1/00
U.S. Cl. 60—739 8 Claims

1. For a gas turbine engine having a combustor, a fuel-supply system for supplying fuel to the combustor and a plurality of fuel injectors for carrying fuel through a combustor outer

casing to inject the fuel inside the combustor, an improved fuel-supply system comprising:

a fuel manifold positionable around the combustor outer casing and including a primary fuel flowpath effective for providing fuel to said fuel injectors and a secondary fuel flowpath effective for collecting any leakage fuel that escapes said primary flowpath, wherein said fuel manifold is comprised of:

a plurality of manifold segments and a plurality of fuel injector base sections, said manifold segments interconnecting said base sections of said fuel injectors, each of said manifold segments being effective for accommodating thermal expansion and contraction to reduce thermal strain and



comprising an annular inner wall defining a first portion of said primary fuel flowpath and an annular outer wall spaced from and surrounding said inner wall for defining therebetween a first portion of said secondary fuel flowpath; each of said injector base sections having an inner passage defining a second portion of said primary fuel flowpath, said inner passage being in flow communication with said first annular inner wall of an adjoining manifold segment; and wherein each injector base section also has an outer passage defining a second portion of said secondary fuel flowpath, said outer passage being in flow communication with said annular outer wall of each adjoining manifold segment.

4,467,611

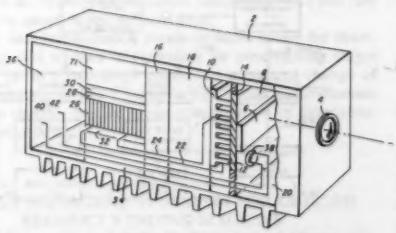
THERMOELECTRIC POWER GENERATING DEVICE

John L. Nelson; Robert L. Montgomery, both of Garland, and Richard J. Buist, Richardson, all of Tex., assignors to Marlow Industries, Inc., Dallas, Tex.

Filed Dec. 13, 1982, Ser. No. 432,783

Int. Cl.³ F25B *21/02*

U.S. Cl. 62—3 **7 Claims**



1. A thermoelectric power device comprising:

(a) a thermoelectric power generator means for generating means for generating dc power, said thermoelectric power generator means including a thermoelectric heat pump and a heating element means operatively connected to the thermoelectric heat pump for generating a dc power supply in response to the thermal energy emanating from the heater element, said heater element means including a heating element and a zero voltage control means operatively connected to the heating element for controlling the ac power applied thereto, said zero voltage control means having a zero voltage switch means and a bi-directional triode thyristor (triac), the triac having a trigger terminal connected to the zero voltage switch means for controlling the ac power supplied to the heater element; and

(b) a thermoelectric heat pump operatively connected to the thermoelectric power generator means for producing, selectively, heating and cooling characteristics in response to the dc power generated by the thermoelectric power generator.

4,467,612

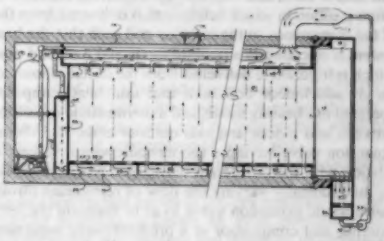
REMOVABLE PALLET FLOOR FOR CHILLED VEGETATION TRANSPORT

George E. Weasel, Jr., 450 Australian Ave., Suite 503, West Palm Beach, Fla. 33401

Filed Feb. 28, 1983, Ser. No. 470,277

Int. Cl.³ F24F *3/16*

U.S. Cl. 62—78 **17 Claims**



1. An insulated transport container having

(a) a floor,

(b) a ceiling,

(c) walls, and

(d) at least one door enclosing

(e) a container interior,

(f) sprinkler means on the container for sprinking chilled water onto vegetation therein,

(g) injection means on the container for injecting cold inert gas therein proximate the floor,

(h) release means on the container for controllably releasing gases from the container interior,

(j) drain means fluidly associated with the container at the floor for draining the water; wherein the improvement comprises in combination with the above:

(k) a plurality of pallets on the floor,

(l) each pallet having

(i) a substantially solid pallet top,

(ii) at least two parallel spaced apart runners attached below the pallet top and resting on the floor,

(iii) small apertures in the pallet top fluidly connected to

(iv) at least one void between the runners, the floor, and the pallet top extending between pallet ends,

(m) the pallets being aligned end to end in at least one row to form a false floor above the floor with the pallet voids fluidly connected to form at least one fluid conduit below the false floor that is fluidly connected to

(i) the space above the false floor through the apertures,

(ii) the injection means, and

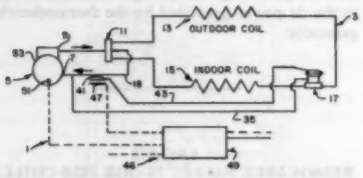
(iii) the drain means.

4,467,613

APPARATUS FOR AND METHOD OF AUTOMATICALLY ADJUSTING THE SUPERHEAT SETTING OF A THERMOSTATIC EXPANSION VALVE

Joseph L. Behr, Des Peres, and David P. Hargraves, Webster Groves, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 19, 1982, Ser. No. 359,941
Int. Cl.³ F25B *1/00, 13/00*
U.S. Cl. 62—115 **9 Claims**



1. In a heat pump system comprising a compressor having an inlet and an outlet, a first coil located out of doors, a second coil located indoors, said indoor and outdoor coils being in communication with one another, a shiftable valve connected to the outlet and the inlet of the compressor and to the outdoor and indoor coils, said valve being selectively shiftable between a first position in which refrigerant is delivered from the outlet of the compressor to the outdoor coil such that the heat pump system is operated in a cooling mode and a second position in which refrigerant is delivered from the outlet of said compressor to said indoor coil such that said heat pump system is operated in a heating mode, and a thermostatic expansion valve between said indoor and said outdoor coils, said thermostatic expansion valve having a thermostatic sensor in heat transfer relation with the refrigerant discharged from one of said coils for automatically varying the flow of refrigerant through said thermostatic expansion valve so as to maintain the refrigerant entering said compressor at a predetermined superheat level, said thermostatic expansion valve being pre-set at a predetermined superheat setting, wherein the improvement comprises: an electric heater in heat transfer relation with said thermostatic sensor, and control means responsive to an operating parameter of said heat pump system operating parameter for varying the heat output of said heater thereby to vary said superheat setting of said thermostatic expansion valve, said control means including means responsive to said heat pump system operating parameter when the heat pump system is in its heating mode for operating said heater along a first heater power output versus said operating parameter value function and being further responsive to said heat pump refrigeration system operating parameter when the heat pump system is in its cooling mode for operating said heater along a second heater power output function versus said operating parameter value function.

4,467,614

METHOD AND APPARATUS FOR REMOVING CONDENSATE AND OIL PARTICLES FROM A STREAM OF COMPRESSED AIR USED IN THE PRODUCTION OF SNOW

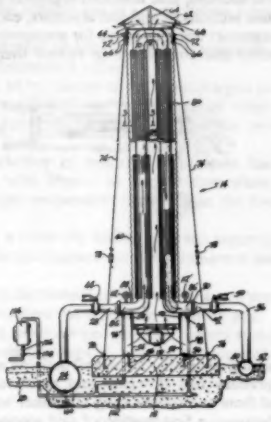
Joseph C. Tropeano; Joseph T. Tropeano, and Thomas F. Tropeano, all of 12 Revere St., Lexington, Mass. 02173

Filed Jan. 12, 1983, Ser. No. 457,259
Int. Cl.³ B01D *9/04;* **F28C** *1/00*
U.S. Cl. 62—124 **12 Claims**

1. In an installation for making snow wherein a stream of compressed air and a stream of pressurized water are fed from a compressor station and a pumping station via separate lines to the nozzles of snow-making equipment where said compressed air and pressurized water are mixed to produce a stream of snow particles, an apparatus for removing condensate and oil particles from said stream of compressed air comprising:

conduit means for feeding a stream of compressed air from said compressor station to said snow-making equipment;

cooling means associated with said conduit and positioned upstream of said snow-making equipment for cooling the stream of compressed air so as to crystallize the condensate and allow the oil particles to adhere thereto;



means downstream of said cooling means for holding the crystallized condensate and oil particles in a holding zone;

heating means associated with said holding zone for heating said holding zone so as to liquefy the condensate; and

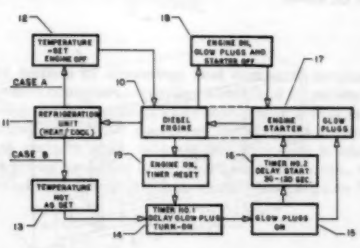
means for separating said liquefied condensate and oil particles from said compressed air stream in said holding zone.

4,467,615

CONTROL SYSTEM FOR DIESEL POWERED REFRIGERATION PLANT

Robert A. Potjes, Costa Mesa, and Rudolph C. Degroot, Sr., Laguna Niguel, both of Calif., assignors to Sencon Engineering Inc., Laguna Niguel, Calif.

Filed Jan. 15, 1982, Ser. No. 339,287
Int. Cl.³ G05D *23/32;* **F25B** *27/00;* **F02N** *17/00*
U.S. Cl. 62—158 **13 Claims**



1. A control system for a diesel powered refrigeration plant, comprising:

a. a diesel engine;

b. starter means for the engine, including glow plug heaters for the engine;

c. a refrigeration plant, including heating and cooling means powered by the diesel engine;

d. means for controlling the turn on of diesel engine power to the heating and cooling means, including:

i. first and second temperature sensing means, one of said means being adapted to sense temperature fluctuations near an open door of the refrigerator;

ii. temperature setting means to set the temperature level of the refrigeration plant;

iii. a first timer delay, the temperature sensing means near the open door of the refrigerator being adapted to override the first time delay; and,

iv. a second timer actuated by the first timer, and adapted to activate the glow plugs and starter means; whereby,

A. when the refrigerator temperature equals the set temperature level, the diesel engine is off;

B.

i. when the refrigerator temperature is outside the set temperature level, the first timer delay turns on the second timer; and,

ii. the second timer delay activates the glow plugs and engine starter to start the diesel engine; and,

C. when the diesel engine is started, the glow plug heaters and starter is turned off.

4,467,616

TEMPERATURE CONTROL SYSTEM FOR AN AIR CONDITIONER

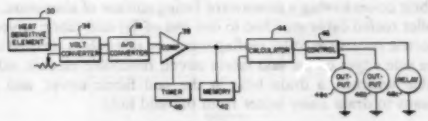
Hajime Kitauchi, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 353,211, Mar. 1, 1982, abandoned. This application Sep. 30, 1983, Ser. No. 537,159

Claims priority, application Japan, Mar. 3, 1981, 56-30903

Int. Cl.³ H02J *1/00*; F25B *7/00*

U.S. Cl. 62—175 **6 Claims**



1. A temperature control system for an air conditioner having a plurality of air conditioning stages, said system comprising a sensor means for sensing an actual temperature of air conditioned air, a memory means for storing the sensed actual temperature therein, a calculating means for calculating a rate of change in temperature per unit time from the sensed actual temperature of the air and a previous actual air temperature which occurred before a predetermined time interval and which was stored in the memory means, and a determination means for determining the number of operating air conditioning stages in accordance with a set temperature for said air conditioned air, said sensed actual air temperature and said rate of change in temperature per unit time;

wherein said determination means includes means for determining said number of operating air conditioning stages based on m temperature points and n rates of change of temperature, m and n being integers, said determination means thereby having m×n combinations of determination criteria.

4,467,617

ENERGY MANAGEMENT SYSTEM FOR CHILLED PRODUCT VENDING MACHINE

Annis R. Morgan, Jr., and Eddie W. King, both of Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation of Ser. No. 198,172, Oct. 17, 1980, abandoned. This application Feb. 16, 1983, Ser. No. 466,959

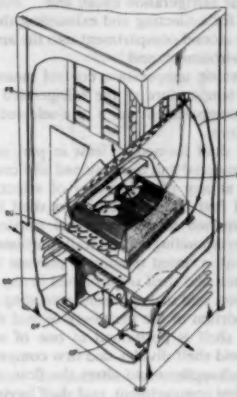
Int. Cl.³ F25D *17/06*; G05D *23/32*

U.S. Cl. 62—180 **4 Claims**

1. In a refrigeration system for a chilled product vending machine including a refrigeration compressor, temperature sensor means for detecting the temperature within said vending machine and turning said compressor ON and OFF to define a compressor cycle in response to the detection of predetermined temperature limits, an evaporator coil and evaporator fan means for blowing air across said evaporator coil and circulating said air throughout said vending machine, the improvement comprising:

means for turning said evaporator fan means ON simultaneously with said compressor for a time period at least as long as said compressor cycle;

means for turning sid evaporator fan means OFF a predetermined period of time after said compressor is turned OFF, said period of time being long enough to permit the temperature of said evaporator coil to temperature stabilize above the freezing temperature of water and



cycle timer means for intermittently turning said evaporator fan means ON and OFF for predetermined periods between said compressor cycles to thereby circulate air over the chilled products, maintain an even distribution of chilled air within said machine and minimize temperature fluctuations of the chilled products.

4,467,618

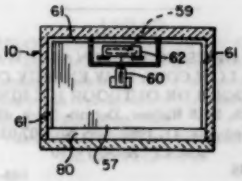
CIRCULATING AIR REFRIGERATOR WITH REMOVABLE DIVIDER SHELF

Edward Gideseg, 22 Park Pl., Great Neck, N.Y. 11021

Division of Ser. No. 894,603, Apr. 7, 1983, Pat. No. 4,304,101. This application Jul. 15, 1981, Ser. No. 283,482

Int. Cl.³ F25D *17/04*

U.S. Cl. 62—187 **6 Claims**



1. A refrigerating apparatus which utilizes circulating refrigerated air to cool food stuffs or the like which comprises:

(a) a first thermostatically temperature controlled compartment for the storage of perishable food stuffs, said first compartment being provided with at least one front door for selective access to the first compartment;

(b) a second compartment adjacent to and insulatable from the first compartment;

(c) a wall separating the first compartment from the second

compartment, said wall having first and second openings therein which openings define first and second passageways interconnecting the first and second compartments;

(d) a refrigeration system mounted within the second compartment comprising:

(i) a compressor and condenser coil;

(ii) a freezer coil; and

(iii) a blower adjacent the freezer coil circulating refrigerated air through the passageways between the first and second compartments to cool the first compartment during the refrigeration cycle; and

(iv) means for collecting and exhausting the melted frost from the second compartment into the ambient temperature environment; and

(v) thermostatic temperature control means for controlling the temperature of the refrigerated air from said second compartment at a pre-selected, refrigerated temperature;

(e) a divider shelf formed at least in part of at least one insulating material and dimensioned and configured to be positioned at any of a plurality of selectable locations within said first compartment, said shelf having sealing means positioned along peripheral portions thereof to engage corresponding inner wall portions of said first compartment in sealed relation to prevent the flow of air thereby when said shelf is positioned in any of said selectable locations, said sealing means extending at least over a sufficient portion of the periphery of said shelf such that when said shelf is positioned in one of said selectable locations, said shelf divides said first compartment into at least two sub-sections and alters the flow of refrigerated air in said first compartment, said shelf having an aperture which permits passage of refrigerated air therethrough, said shelf defining a space with the front door when in any of said selectable locations for return of spent refrigerated air from the sub-section of said first compartment distant from said second compartment to the sub-section closest to said second compartment, so that the spent refrigerated air may be returned to said second compartment through at least one of said first defined openings and corresponding passageways, said shelf being provided with aperture and temperature sensing control means to vary the size of the aperture in response to temperatures sensed by said control means in the sub-section of said first compartment distant from said second compartment so as to selectively permit the flow of refrigerated air therethrough to thermostatically maintain the temperature of said sub-section of said first compartment distant from said second compartment under the control of the temperature sensing and control means of said shelf, and the sub-section of said first compartment closest to said second compartment is thermostatically maintained at below-freezing temperatures under the thermostatic control means of said refrigeration system in said second compartment.

4,467,619

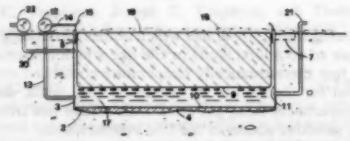
METHOD OF USING FROZEN SALT WATER TO MAINTAIN A LOW COST, LOW ENERGY CONSUMING INDOOR OR OUTDOOR ICE RINK

Bruce F. Kovach, 5918 Radnor, Detroit, Mich. 48224

Filed Aug. 11, 1982, Ser. No. 407,031

Int. Cl.³ A63C *19/10*

U.S. Cl. 62—235 **9 Claims**



1. A method of maintaining an outdoor ice rink where an ice base is built up, channels are cut in the said ice bases, headers are cut along the sides of the said ice base, a lower layer of polyethylene is laid out over the said channels and headers, the said lower layer of polyethylene is flooded with salt water, an upper layer of polyethylene is applied over the said salt water, the edges of the said upper layer of polyethylene and the said lower layer of polyethylene are secured by a securing means, ice is frozen over the said upper layer of polyethylene, a layer of aluminum foil is applied over the said ice, an ice surface is frozen over the said aluminum foil, salt water coolant is circulated between the said upper layer of polyethylene and the said lower layer of polyethylene, a header box and side boards is placed over the said headers, slits are provided in the said side boards near the said ice surface, sub-freezing air is circulated through the said slits and over the said ice surface, said salt water coolant is supplied to the said chanels by a method of supplying refrigeration comprising of an excavation in the ground, fender boards around the top of the said excavation, a waterproof liner in the said excavation, filling the said excavation with salt water, pumping the said salt water from the bottom of the excavation and spraying it out over the surface of the said salt water during freezing winter weather and filling the said excavation with frozen salt water, covering the said frozen salt water with a layer of polyethylene followed by a layer of insulating straw during the warm weather months, circulating salt water refrigerant over the said frozen salt water and supplying it to the said outdoor ice rink, supplying said sub-freezing air through the said slits and over the said ice surface by means of a heat transfer unit which works in conjunction with the said method of supplying refrigeration, placing a structure for selectivity providing shade over the said outdoor ice rink consisting of support posts, a waterproof fabric cover having a downward facing surface of aluminum, a roller reefed cable attached to one end of the said fabric cover, electric reversible roller reefing winches, side cables secured to the side edges of the said fabric cover, reversible electric side cable winches, a drain hole in the said fabric cover, and a means to drain away water from the said hole.

4,467,620

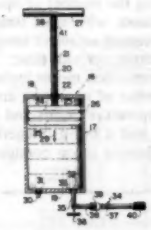
OIL INJECTOR FOR REFRIGERANTS OF AIR CONDITIONERS AND THE LIKE

Gordon C. Bradley, Box 542, and Ben E. Coleman, Box 1836, both of, both of Assiniboia, Saskatchewn, Canada S0H 0B0

Filed Dec. 14, 1982, Ser. No. 449,597

Int. Cl.³ F25B *45/00*

U.S. Cl. 62—292 **24 Claims**



1. In a refrigeration system which includes a compressor and an evaporator with the usual conduits extending therebetween and having a refrigerant charging port on the high or low pressure sides of the compressor; a device for injecting a predetermined amount of refrigerant oil into said system, said device comprising in combination a cylinder, a piston reciprocal within said cylinder, an end cap on one end of said cylinder, a piston rod extending from one side of said piston and screw threadably engaging through said end cap whereby rotation of said piston rod moves said piston within said cylinder, a further

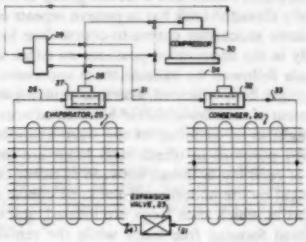
end cap on the other end of said cylinder, filling means in said further end cap and an injector assembly operatively connected to said further end cap, said injection assembly including a manually operated valve, means for purging said injector assembly and means for detachably connecting said injector assembly to the high or low pressure side of a refrigeration system for injecting oil into said system.

4,467,621

FLUID/VACUUM CHAMBER TO REMOVE HEAT AND HEAT VAPOR FROM A REFRIGERANT FLUID

Paul R. O'Brien, Roosemelt Twrs. #3, 500 N. Roosemelt Blvd., Falls Church, Va. 22044

Filed Sep. 22, 1982, Ser. No. 421,320
Int. Cl.³ F25B *13/00*
U.S. Cl. 62—324.1 22 Claims



1. In a cooling cycle wherein fluid is passed through a condenser, an expansion valve and an evaporator, at least one fluid vacuum chamber in the flow path between the evaporator and condenser to reduce the latent heat of vaporization of said stream passing between said evaporator and said condensor said chamber comprising:

(a) an elongated housing means having an inlet for a vapor-liquid dual phase stream at one extreme thereof and an outlet for a vapor-liquid dual phase stream at the opposite end of said elongated housing for egression of a vapor-liquid dual phase stream having a reduced heat of vaporization compared with the heat of vaporization of said stream ingressing through said inlet;

(b) a means for passage of said vapor-liquid dual phase stream in a pathway relatively parallel to the axes of said elongated housing means;

(c) at least one tubular element within said elongated housing means having porous openings of from about 5 microns to about 100 microns being formed of sintered metal or ceramic for passage of at least a portion of the heat of vaporization through said pores of said sintered metal or ceramics to the interior of said tubular element, wherein said passage is achieved by maintaining the interior of said tubular member at a pressure lower than the pressure within said elongated housing means;

(d) a vacuum attainment means in interconnection with the interior of said tubular member to provide said lower pressure within said tubular element; and,

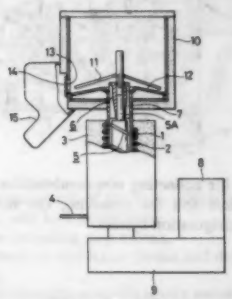
(e) a vacuum conduit means interconnecting said interior of said tubular element and said vacuum attainment means.

4,467,622

AUGER-TYPE ICEMAKER

Shigeyuki Takahashi, Ota; Nobuyuki Yoshida, Ora, and Masahiro Kobayashi, Ota, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Sep. 15, 1982, Ser. No. 418,192
Claims priority, application Japan, Sep. 18, 1981, 56-139530[U]; Sep. 18, 1981, 56-139531[U]; Aug. 9, 1982, 57-138837
Int. Cl.³ F25C *5/14*
U.S. Cl. 62—354 13 Claims



1. An icemaker for producing hard chip, shaped ice comprising:

refrigerated cylinder means having an upper end for forming ice on an inner cylindrical surface thereof;

an auger rotatably mounted within said refrigerated cylinder to scrape ice from said inner cylindrical surface and advance same; and

bearing means mounted to said cylinder and carrying said auger, said auger advancing said scraped ice thereto, said bearing means having a peripheral surface comprised of an inverted frusto-conical surface extending radially outward and into and contiguous with a cylindrical surface spaced a substantially constant distance from and parallel to said inner cylindrical surface, a plurality of axial ribs projecting outwardly from said peripheral surface into abuttment with said inner cylindrical surface, said frusto-conical surface, said cylindrical bearing surface, said axial ribs, and said inner cylindrical surface comprising passages for compressing and shaping ice therein to form ice chips at said upper open end of said refrigerated cylinder.

4,467,623

COUNTERFLOW ABSORBER FOR AN ABSORPTION REFRIGERATION SYSTEM

Robert C. Reimann, Lafayette, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 6, 1983, Ser. No. 456,132
Int. Cl.³ F25B *37/00*
U.S. Cl. 62—494 3 Claims

1. An absorber for an absorption refrigeration system comprising:

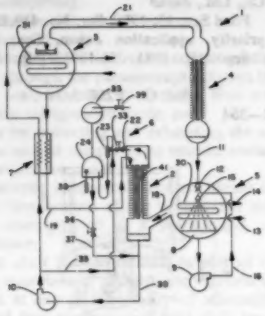
a plurality of substantially vertical tubes;

a first header means for directing strong absorbent solution to the tops of the substantially vertical tubes;

a second header means for directing refrigerant vapor to the bottoms of the substantially vertical tubes at a volume flow rate sufficient to create a direct counterflow of the refrigerant vapor and the strong absorbent solution along the entire length of each of the tubes whereby the refriger-

ant vapor is absorbed by the strong absorbent solution to form weak absorbent solution;

means for collecting the weak absorbent solution; and



purge means for collecting non-condensibles from the first header means and for removing the non-condensibles from the refrigeration system.

4,467,624

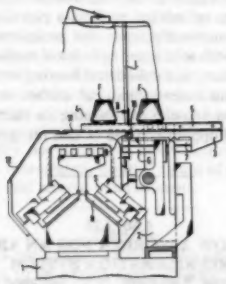
FLAT KNITTING MACHINE WITH SPOOL SHELF

Reinhold Schimko, Aalen-Wasseralfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik, Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed Nov. 22, 1983, Ser. No. 554,404

Int. Cl.³ D04B *3/06, 15/48, 27/10, 35/00*

U.S. Cl. 66—125 R **6 Claims**



1. A flat knitting machine comprising an elongated spool shelf arranged to carry yarn spools and yarn guide means and positioned parallel above and to the rear of the needle bed or beds and carriage of the machine, wherein:

(a) the spool shelf is mounted to be movable in a direction orthagonal to said needle bed or needle beds without skewing from a rearward position to a forward position, wherein in the forward position the shelf overlies at least a part of the needle bed or beds and of the carriage,

(b) a cover strip is provided at the forward edge of the shelf extending lengthwise of the machine, and

(c) a flap is pivotably mounted on the machine which, in combination with the cover strip, defines a cover for the needle bed or beds and carriage.

4,467,625

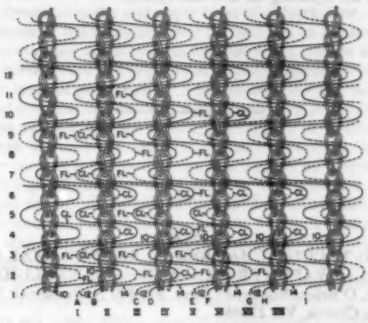
TWO BAR WARP-KNITTED LOOP FABRIC

Milton Kurz, Pond Crossing, Lawrence, N.Y. 11559

Filed Nov. 2, 1983, Ser. No. 547,882

Int. Cl.³ D04B *23/08, 23/10*

U.S. Cl. 66—193 **1 Claim**



1. A two-bar warp-knitted loop fabric comprising a first group of threads forming warp chains knitted by the front bar threaded in; out, thereby leaving unoccupied warp positions between adjacent chains, and a second group of threads laid in from a fully threaded back bar in pattern repeats consisting of at least three successive course-to-course free loops located alternately in the unoccupied positions on either side of each warp chain followed by at least three successive course-to-course caught loops located alternately in adjacent chains, each segment of each lay-in thread between adjacent free loops being caught in an underlay of the warp chain between the unoccupied positions in which such loops are located, each segment of each lay-in thread between adjacent caught loops being caught by the underlays in the same course of the adjacent chains in which such loops are located, and every other lay-in thread forming free loops while the remaining lay-in threads form caught loops in the same courses and vice versa.

4,467,626

SOCK WITH DOUBLE-LAYER FABRIC IN FOOT AND METHOD

William H. Coble; Harper Shields, both of Burlington, and Roscoe M. Farrell, Pittsboro, all of N.C., assignors to Kayser-Roth Hosiery, Inc., New York, N.Y.

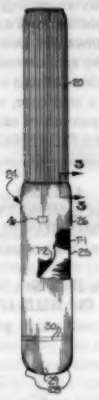
Filed Jan. 31, 1983, Ser. No. 462,707

Int. Cl.³ D04B *7/04*

U.S. Cl. 66—196 **14 Claims**

1. In a sock including a single-layer leg portion knit of successive courses including a predetermined number of stitch loops forming adjacent wales in successive courses, and a foot portion knit integral with said leg, said foot portion including toe, heel, sole, and instep areas with said toe area including a closure seam, the improvement wherein at least a substantial portion of said foot portion comprises double-layer fabric providing improved cushioning characteristics, said double-layer fabric including separate inner and outer layers each extending completely around said substantial portion of said foot portion, said inner and outer layers each comprising an independently knit and separate layer and including an equal number of wales and the number of wales in said inner and outer layers being the same number of wales as the number of wales in said leg, and said inner and outer layers each including

forward ends connected together by said toe portion closure seam and rear ends integrally knit with each other in a continuous manner and being integrally knit with said single-layer leg portion.

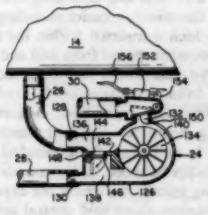


4,467,627

PUMP FOR A DISPENSING SYSTEM FOR AN AUTOMATIC WASHER

Clark I. Platt, St. Joseph Township, Berrien County, and James R. Hageman, Berrien Springs, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 16, 1982, Ser. No. 450,348
Int. Cl.³ D06F *39/02, 39/08*; F01D *1/30*
U.S. Cl. 68—17 R **11 Claims**



11. In a dispensing system connectable to a drain, a pump housing containing a pump used in connection with a dispensing chamber wherein said pump housing contains

an inlet,

a first and second outlet,

a rotating impeller operable to pump liquid in a first and second direction,

a selectively operable port means interior of said pump housing to permit liquid flow from said inlet in two directions within said pump housing around said impeller,

selectively operable valve means at said first outlet,

conduit means connecting said first outlet with said dispensing chamber, and

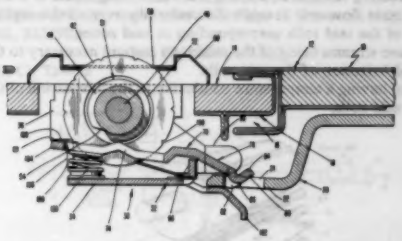
conduit means connecting said second outlet with said drain, whereby liquid can be pumped from said inlet to said dispensing chamber when said impeller is rotating in said first direction and from said drain when said impeller is rotating in said second direction.

4,467,628

COMBINATION LOCK

Louis Zampini, Jr., North Providence, R.I., assignor to American Tourister, Inc., R.I.

Filed Apr. 28, 1982, Ser. No. 372,232
Int. Cl.³ E05B *37/02*
U.S. Cl. 70—312 **15 Claims**



1. A permutation lock of the type which is to receive and lock to a hasp, said lock comprising:

frame means including stop means,

a shaft mounted to said frame means and defining a longitudinal axis,

a plurality of manually actuable rotary members mounted on said shaft for rotary movement about said longitudinal axis, each rotary member including:

an annular actuating surface having a camming segment and an indented segment, and

an annular indicator surface carrying indicia and being in driving engagement with said actuating surface,

a bolt spaced from said shaft and including slot means through which said indicator surfaces project such that said actuating surfaces are engageable with said bolt, said bolt including front and rear ends,

said rear end being disposed at said stop means and such that said stop means being situated on the same side of said bolt as said longitudinal axis,

said front end having a deflecting surface and a latch disposable in a locking position when said bolt is engaged by an opposing one of said camming segments, and in an unlocking position when said bolt is opposed by all of said indented segments,

spring means for biasing said bolt toward said actuating surfaces of said rotary members and biasing said rear end of said bolt against said stop means of said frame means,

said spring means being yieldable to enable said camming segments to swing said bolt about a first fulcrum at said stop means to move said latch from said unlocking position to said locking position,

said rear end of said bolt means being unsupported opposite said stop means so as to be movable in a direction away from said stop means in response to swinging of said bolt about a second fulcrum defined by at least one of said camming segments to enable said latch to be moved toward said unlocking position from said locking position when so urged by said hasp acting against said deflecting surface.

4,467,629

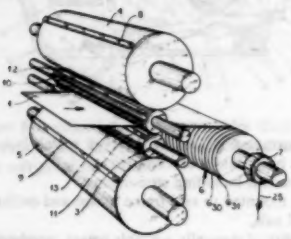
METHOD OF FLATTENING STEEL STRIP IN ROLLING MILL

Werner Schimion, Hilchenbach, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 308,036
Int. Cl.³ B21B *37/12, 27/10, 45/02*
U.S. Cl. 72—17 **7 Claims**

1. A method of rolling a steel strip, said method comprising the steps of:

passing said strip longitudinally in a predetermined travel direction through a nip between a pair of parallel rolls;
passing said strip downstream in said direction from said rolls over a sensor that engages said strip at a plurality of zones spaced apart on said strip transverse to said direction;
generating respective output signals coresponding to the deviations from planarity of said strip at said zones;
directing streams of cooling and lubricating liquid at a constant flow rate at said rolls uniformly over all the regions of the said rolls corresponding to said zones,
these streams being of the minimum amount necessary to the lubrication of the said rolls,
and having a temperature conducive to the lubrication of the said rolls,



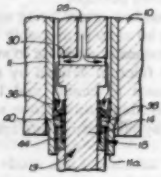
directing additional streams of at least one other liquid, at the regions of said rolls corresponding to said zones, controlling the amount of the stream of this other liquid being applied within each of the regions by the respective one of the said output signals for varying the stream between 0 to 100 percent of a maximum stream thereof, the temperature of this other liquid being lower than that of the first-mentioned liquid referred to in the preceding paragraph for varying the heat exchange between said streams and said rolls in accordance with the respective output signals to thermally change the diameters of said rolls in the respective regions and thereby eliminate the deviations in planarity detected by said sensor.

4,467,630

HYDRAULIC SWAGING SEAL CONSTRUCTION

John W. Kelly, Burbank, Calif., assignor to Haskel, Incorporated, Burbank, Calif.

Filed Dec. 17, 1981, Ser. No. 331,672
Int. Cl.³ B21D *22/10*
U.S. Cl. 72—62 **14 Claims**



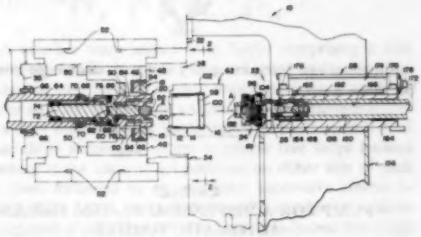
1. A swaging mandrel for confining a working fluid to a pressure zone within a tube whereby said tube can be expanded radially comprising:
a support to be positioned axially within said tube; and
a pair of axially separated deformable sealing members encircling said support to be compressed axially and expanded radially upon the application of pressure thereto by said working fluid thereby defining boundaries of said pressure zone, at least one of said sealing members having an annular heel and annular inner and outer lips extending from said heel and defining therebetween an annular cavity that opens in a generally axial direction, said outer lip having a first portion normally extending radially outwardly and axially away from said heel and a second portion normally extending radially inwardly and axially away from said first portion, whereby said second portion facilitates radially inward compression of said sealing member to permit insertion thereof in a said tube, said outer lip facilitating radially outward expansion of said sealing member under pressure to maintain a fluid-tight interface with said tube.

4,467,631

APPARATUS FOR SPLINING THIN-WALL POWER TRANSMISSION SLEEVES

James T. Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Filed Jul. 8, 1982, Ser. No. 396,188
Int. Cl.³ B21D *17/04*
U.S. Cl. 72—88 **8 Claims**



1. Apparatus for forming end splines on one end of a dual ended thin-wall sleeve for transmitting torque, said apparatus comprising: a pair of toothed dies mounted in spaced relationship to each other for movement in opposite directions; an externally toothed mandrel mounted between the dies for rotation about a central axis including first mating means extending axially therefrom; a loader including a radially expandable mandrel which is inserted within the sleeve and radially expanded at a location spaced from said end thereof in order to secure the sleeve, said loader including second mating means axially spaced from said expandable mandrel and extending axially away from said expandable mandrel for mating with said first mating means between said mandrels and within the sleeve secured to said expandable mandrel to provide a concentric relationship between said mandrels during splining; a rotatable loading spindle on which the expandable mandrel is mounted for rotation about said central axis; and an actuator that moves the loading spindle axially to position said one end of the sleeve over the toothed mandrel such that die movement meshes the die and mandrel teeth with the sleeve end therebetween to form thin-wall splines whereupon the actuator moves the loading spindle axially away from the toothed mandrel for unloading of the splined sleeve.

4,467,632

METHOD OF MAKING A WOUND CORE FOR AN ELECTRIC TRANSFORMER

Willi Klappert, Hickory, N.C., assignor to General Electric Company, King of Prussia, Pa.

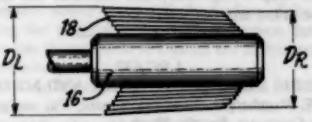
Filed Apr. 5, 1982, Ser. No. 365,206
Int. Cl.³ B21C *47/04*; H01F *3/04*
U.S. Cl. 72—147 **15 Claims**

1. A method of making a wound core for a transformer, comprising:
(a) providing a plurality of elongated sheets primarily of magnetic steel, each sheet having a longitudinally-extend-

ing center line located between laterally opposed sides of the sheet,

(b) winding said sheets in superposed relationship about an arbor, thereby forming an annulus of gradually increasing diameter surrounding the arbor,

(c) sensing any telescoping action by said sheets as they are wound about said arbor and the direction of such telescoping action considered laterally of said elongated sheets,



(d) following the occurrence of a predetermined amount of said telescoping action in a sheet, providing sheets that subsequently enter said annulus with thickening means effectively thickening said subsequent sheets at one side relative to their other side, the thickened side being located at a side of said sheet center line opposite to the lateral direction in which said telescoping occurs, and

(e) removing said annulus from said arbor after a predetermined number of sheets have been wound about said arbor.

4,467,633

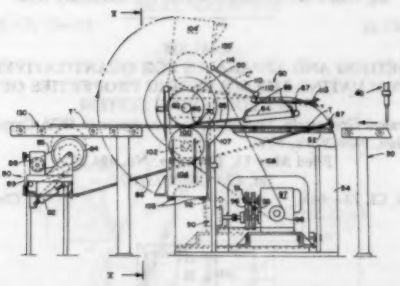
TROUGH, MANUFACTURING PROCESS, AND APPARATUS

Stephen N. McEwen; Robert L. Stevens; Barry R. Benschoter, all of Bowling Green, and Robert F. Benschoter, Portage, all of Ohio, assignors to Henry Filters, Inc., Bowling Green, Ohio

Division of Ser. No. 276,059, Jun. 22, 1981, Pat. No. 4,420,868. This application Oct. 11, 1983, Ser. No. 531,454

Int. Cl.³ B21B *1/00*; B21D *11/04, 9/05*

U.S. Cl. 72—203 **12 Claims**



1. A trough-forming machine comprising:

(A) a source of flat metal sheets having parallel sides,

(B) a horizontal conveyor means for feeding said sheets,

(C) means for intermittently clamping said sheets to prevent movement along said conveyor means,

(D) cutting means movable transversely of said conveyor means and said clamped sheets,

(E) means for adjusting the angle of said transverse movement of said cutting means to form isosceles trapezoidal-shaped sheets with converging end edges,

(F) a convex mandrel having means to clamp each said trapezoidal-shaped sheet intermediate its said converging end edges, and

(G) roller means for wrapping the unclamped major portion of said trapezoidal-shaped sheet around said mandrel to form a U-shaped trough with parallel equal sides.

4,467,634

INTERNAL COMBUSTION ENGINE KNOCKING SENSING AND RECOGNITION SYSTEM

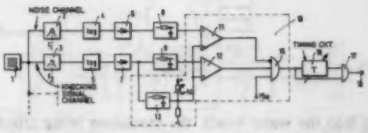
Siegfried Rohde, Schwieberdingen; Jörg Boaitz, Mühlacker; Robert Entenmann, Benningen; Rochus Knab, Kornwestheim, and Herbert Schramm, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,094

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133703

Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **15 Claims**



1. Internal combustion engine knocking or pinging sensing and recognition system having

a sensor (1) providing output signals representative of combustion conditions in a cylinder of the internal combustion engine, in which the combustion condition may cause knocking,

said output signals including, upon knocking, knocking signals and noise, or stray, or interference signals mixed with the knocking signals, said output signals, under other, or normal combustion conditions, including only said stray, or noise, or interference signals,

comprising, in accordance with the invention,

at least two frequency selective filters (2, 3) having different pass frequencies connected to the sensor (1),

wherein one of the filters (3) is tuned to pass signals having frequencies expected upon engine knocking,

and at least one other filter (2) is tuned to pass signals having a frequency band of expected stray, or noise, or interference frequencies;

threshold means (14, 20) connected for establishing a threshold level;

and comparison circuit means (11, 12) connected to receive the filtered output signals from each of said one filter (3) and said at least one other filter (2) to compare the output from said filters and connected to compare the output from said filters with said threshold level; and

a logic circuit (15) connected to the comparison circuit means (11, 12) and logically decoding the signals derived therefrom to provide binary output knocking recognition signals

if, and only if,

(a) the filtered signal having the frequency expected upon knocking exceeds the threshold level, and

(b) the filtered signals having a frequency band of expected stray, or noise, or interference frequencies is below the threshold level.

4,467,635

LEAK DETECTION IN HEAT EXCHANGER TUBES AND THEIR TUBE SHEET CONNECTIONS

Karl G. Dahmén, and Roger Eriksson, Linköping, Sweden, assignors to Stal Laval Apparat AB, Linkoping, Sweden

Filed Jul. 22, 1982, Ser. No. 400,610

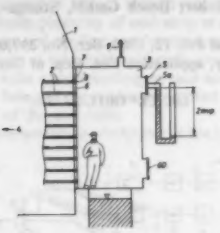
Claims priority, application Sweden, Aug. 21, 1981, 8104959

Int. Cl.³ G01M *3/12*

U.S. Cl. 73—40.5 R **4 Claims**

1. A method for detecting leaks in a shutdown steam condenser and the like having a bundle of tubes with their ends connected in tube sheets having outsides enclosed by water boxes and the tubes and insides of the tube sheets enclosed by

a steam casing; said method comprising giving the casing access to the ambient air, reducing the air pressure in the water boxes to below that of the ambient air, and from within at least one of the water boxes examining the tube ends and their connections in the tube sheet for leakage of the air from the



casing into the water boxes, the examining being effected by applying to the tube ends and their connections in the tube sheet a fluid that forms air bubbles in the event the air in the casing leaks through either the tubes or their connections in the tube sheet and thereby into that one of the water boxes.

4,467,636

TESTING INSTRUMENT FOR PIPES OR OTHER CAVITIES TO BE TESTED AS TO TIGHTNESS

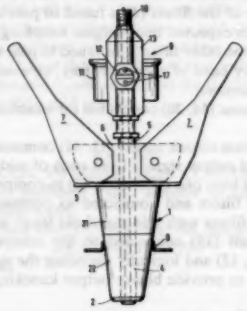
Josef Dagn, Schwendter-Str. 231a, 6345 Kössen (Tirol), Austria

Filed Aug. 11, 1982, Ser. No. 407,167

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 8123556[U]

Int. Cl.³ G01M *3/28*

U.S. Cl. 73—49.8 6 Claims



1. A testing instrument for pipes or other cavities to be tested as to tightness, comprising:

an at least partially conical rubber plug, at each of the two opposite ends of which respective supporting plates are provided;

a pipe extending through the rubber plug and rigidly connected to the said supporting plate at the plug end having a smaller diameter;

said pipe being passed through the other said supporting plate so as to be movable;

said pipe being provided on a protruding section thereof with a band of threading;

a pedestal screwed to said band of threading;

a pair of eccentric levers being tiltably mounted on said pedestal diametrally opposite each other, these levers resting on the said supporting plate at the larger diameter of the rubber plug;

a crown member constructed and arranged to be screwed onto the end of said protruding threaded section of the pipe beyond said pedestal, said crown member being formed by a piece of pipe with an open outer end normally closed by an openable valve;

a manometer and a pop valve arranged at beside of the piece of piping and respectively laterally communicated therewith;

said pop valve being provided with a quick-fitting pipe union for connecting with said piece of piping a CO testing apparatus which comprises a reservoir filled with a test medium;

a water trap being interposed between the quick-fitting kpipe union and the reservoir.

4,467,637

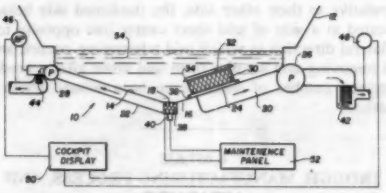
DEBRIS DETECTION SYSTEM AND METHOD

William E. Rumberger, Newtown Square, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 28, 1982, Ser. No. 453,978

Int. Cl.³ G01N *15/06*

U.S. Cl. 73—61 R 23 Claims



1. In a fluid system having a reservoir from which a primary flow and a secondary flow originate for serving a common system, a system for detecting debris originating in the common system being served, comprising:

means for diverting debris from the common system being served to the secondary flow at its point of origin in the reservoir;

monitoring means located in said secondary flow for detecting debris accumulation within the secondary flow.

4,467,638

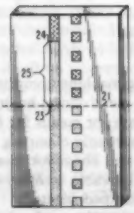
METHOD AND APPARATUS FOR QUANTITATIVELY EVALUATING THE SOLDERING PROPERTIES OF A WAVE SOLDERING SYSTEM

Bernard Greenstein, Hamilton, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 13, 1983, Ser. No. 494,287

Int. Cl.³ G01N *13/00*

U.S. Cl. 73—64.4 12 Claims



1. A method for quantitatively evaluating the soldering properties of a soldering system which includes a molten solder wave for use in the soldering of a printed circuit board assembly having solderable circuitry, said method comprising;

(a) providing a test board having a length and a width, said test board having defined on a surface thereof in the lengthwise direction a pattern comprised of first and sec-

ond spaced apart and parallel strips of a solderable metal, said first strip being formed in a continuous length and said second strip being formed in a discontinuous length, having spaced alternative solderable areas and nonsolderable areas with the distance between the solderable areas and the nonsolderable areas being at least sufficient to prevent bridging of molten solder between the solderable areas;

(b) positioning the test board with the length thereof in alignment with the direction of travel to be taken through the molten solder wave with the surface of the test board having the parallel strips defined thereon being on the underside thereof so as to contact the molten solder of the solder wave;

(c) advancing the test board into the molten solder wave for a distance less than the entire length of the test board but sufficient for the solder of the solder wave to wet out the length immersed into the solder wave;

(d) removing the test board from the molten solder of the solder wave;

(e) determining the approximate point of maximum contact of the molten solder of the solder wave with the test board; and

(f) measuring the distance the solder wicked along the first strip beginning at the point of maximum direct contact of the molten solder with the test board as indicated by the second strip;

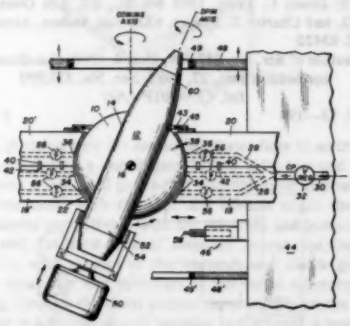
whereby the relative solderability properties of the soldering system can be directly determined by the length of wicking of the solder along the first strip from the point of direct contact with the molten solder of the solder wave.

4,467,639

APPARATUS AND METHOD FOR MEASURING GYROSCOPIC STABILITY

Clarence C. Bush, deceased, late of Bel Air, Md. (by Florence Bush, administratrix), assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1983, Ser. No. 478,754
Int. Cl.³ G01M *1/16*
U.S. Cl. 73—66 **12 Claims**



1. An apparatus for measuring gyroscopic stability of a spinning projectile which comprises:

air bearing ball means for rotatably holding said projectile so that it can freely move in three degrees of angular motion;

motor means for providing torquing power to spin said projectile along a coning axis;

support member air bearing means for providing air bearing surfaces for said ball means, and for supplying pneumatically controlled air to said bearing surfaces;

pneumatic supply means operatively connected to said support member air bearing means for providing pressure regulated air to said support member air bearing means;

electro-magnetic repulsing means for providing an initial nutation to said spinning projectile; and

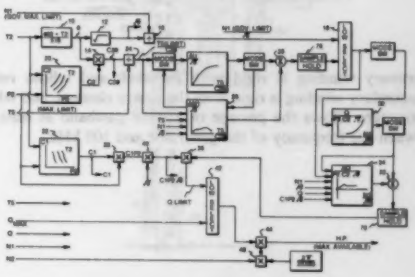
hoop means for restraining said spinning projectile whenever there is severe gyroscopic instability.

4,467,640

GAS TURBINE ENGINE POWER AVAILABILITY MEASUREMENT

Terry Morrison, Vernon, Conn., assignor to Chandler Evans, Inc., West Hartford, Conn.

Filed May 26, 1982, Ser. No. 382,114
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.3 **9 Claims**



1. A method of determining the power which may be produced by a gas turbine engine, the engine having a compressor and power turbine and being instrumented to provide signals commensurate with a pluraltiy of operating parameters and limits, the method comprising the steps of:

determining the maximum permissible engine gas generator speed for the existing engine inlet conditions;

correcting the maximum permissible gas generator speed for deviation in performance of the engine from a predetermined normal;

employing the corrected maximum permissible speed to determine the maximum torque which can be produced for the existing inlet conditions; and

comparing the determined torque with the engine torque limit to ascertain the maximum obtainable torque.

4,467,641

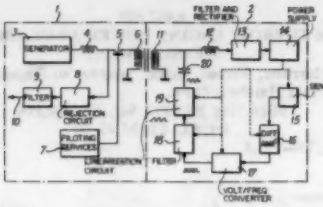
DEVICE FOR MEASURING A PARAMETER ON A ROTARY ELEMENT, AND IN PARTICULAR FOR MEASURING THE PRESSURE OF A PNEUMATIC TIRE ON A WHEEL

Michel Abraham, Elancourt, France, assignor to Precision Mechanique Labinal, France

PCT No. PCT/FR81/00167, § 371 Date Aug. 10, 1982, § 102(e) Date Aug. 10, 1982, PCT Pub. No. WO82/02249, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 22, 1981, Ser. No. 413,371
Claims priority, application France, Dec. 29, 1980, 80 27676
Int. Cl.³ B60C *23/02*
U.S. Cl. 73—146.5 **12 Claims**

1. A device for measuring a parameter pertaining to a rotary element rotating about a shaft carried by a fixed structure, the rotary element carrying at least one sensor for said parameter with an associated electric circuit and the structure carrying, on one hand, an electric energy generator for supplying power to said circuit and, on the other hand, utilization means which are responsive to a signal generated in said circuit, coupling means permitting the transmission of said electric energy of the generator to the sensor circuit and said signal from the sensor circuit to said utilization means, characterized in that said generator generates an electric power at a frequency lower than 10 kHz, said circuit associated with the sensor generates a

signal of a high frequency which varies within a wide band between 20 and 100 kHz, and the coupling between the rotary element and the shaft carried by the structure is ensured by a transformer in the form of a rotating machine whose fixed



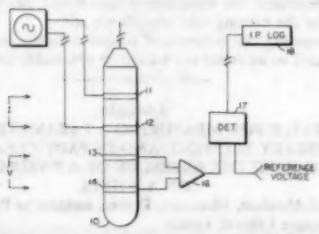
primary winding is rigid with the shaft and whose rotary secondary winding is rigid with the rotary element, and whose structure allows the passage of a wide passband at least between the frequency of the generator and 100 kHz.

4,467,642

METHOD FOR IDENTIFYING COMPLEX LITHOLOGIES IN A SUBSURFACE FORMATION

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,822
Int. Cl.³ E21B *49/00*; G01V *5/10, 3/08*
U.S. Cl. 73—152 **7 Claims**



1. A method for identifying select clay minerals in subsurface formations, comprising the steps of:

(a) conducting in-situ induced polarization measurements in the subsurface formations,

(b) identifying any aluminum content of the subsurface formations through a measurement of delayed gamma-rays from the neutron activation of said aluminum,

(c) identifying any potassium content of the subsurface formations through a measurement of natural gamma-rays from said potassium, and

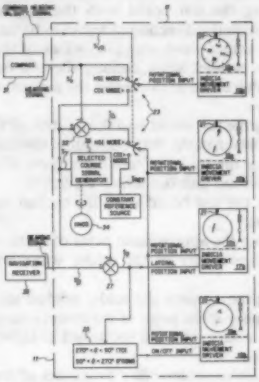
(d) correlating said in-situ measurements of induced polarization, aluminum content, and potassium content with known combinations of such measurements for each of a plurality of select clay minerals to identify the presence of any of said select clay minerals in said subsurface formations.

4,467,643

AIRCRAFT INDICATOR CAPABLE OF OPERATION IN HSI MODE OR CDI MODE

Kenneth W. McElreath, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 28, 1982, Ser. No. 393,167
Int. Cl.³ G01C *21/00*; G09F *9/00*
U.S. Cl. 73—178 R **5 Claims**



1. A horizontal situation indicator (HSI) comprising a display having capability of simultaneously displaying (a) heading, (b) course, and (c) course deviation, and

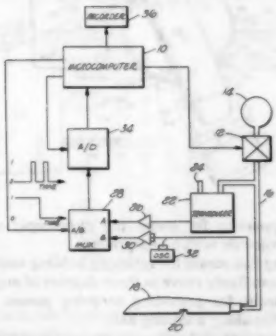
mode conversion means for enabling said HSI display to operate two different modes, one of said modes being a mode wherein (a), (b), and (c) are displayed, and the other said two modes being a mode wherein (b) and (c), but not (a), are displayed.

4,467,644

FLOW METER

James K. Palmer, 134 Fel Mar Dr., San Luis Obispo, Calif. 93401; James C. Long, 1965 8th St., #2, Los Osos, Calif. 93402, and Charles E. Kinzer, 8530 San Andres, Atascadero, Calif. 93422

Continuation of Ser. No. 212,939, Dec. 4, 1980, abandoned. This application Dec. 27, 1982, Ser. No. 438,099
Int. Cl.³ G01F *1/00*
U.S. Cl. 73—198 **9 Claims**



1. A flow meter for gathering a plurality of discrete data points characterizing the flow of liquid in an open channel comprising:

sensor means including separate transducer means for sens-

ing the depth and the velocity of flow of said liquid, said sensor means having upper and lower spaced apart surfaces, said lower surface defining a port therein, and said sensor means having sufficient weight to be positioned with said lower surface at the bottom of said channel and to remain substantially stationary therein without restraint while said liquid flows thereover;

said depth sensing transducer means including means for providing intermittent pulses of pressurized gas to said port; and

said velocity sensing transducer means including means for establishing a magnetic field at said upper means for establishing a magnetic field at said upper surface and measuring electrodes terminating at said upper surface for generating electrical signals representative of liquid flow velocity responsive to the flow of said liquid across said upper surface.

4,467,645

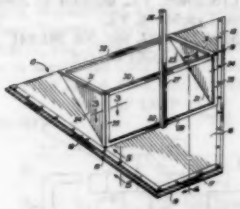
WEIR

A. Pat Murphree, 15215 E. Melrose, Gilbert, Ariz. 85234

Filed Mar. 21, 1983, Ser. No. 477,255

Int. Cl.³ G01F *1/20*

U.S. Cl. 73—215 4 Claims



1. A portable weir for measuring water flow in an irrigation canal comprising a check gate having side, top and bottom edges and a face, said gate being adapted to be disposed in an irrigation canal with the side and bottom edges thereof in engagement respectively with the sidewalls and bottom of the canal and the face thereof disposed across the canal but obliquely with respect to the vertical, said check gate face facing upwardly and upstream of the canal whereby water flowing through the canal presses downwardly on the face of the gate to keep the weir in position in the canal, a weir notch formed in said check gate to provide a weir crest spaced above the bottom edge of the gate and weir side edges extending upwardly from said crest to the top edge of the gate, weir side plates extending vertically upwardly from the weir side edges on said gate, and said weir side plates having upstream edges extending vertically upwardly from said weir crest, and reinforcing members secured to said weir crest, to the upstream regions of said weir side plates and connecting the uppermost regions of said weir side plates for maintaining dimensional stability of the weir, the reinforcing member connecting the uppermost regions of said weir side plates serving as a handle for lifting and carrying the weir.

4,467,646

DEVICE FOR THE CAPACITIVE MEASUREMENT OF LEVELS

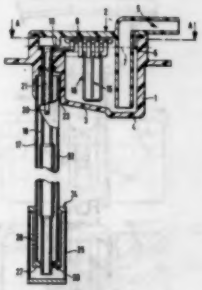
Walter H. Berryman, Croydon; Peter J. Manson, Hawthorn; Adrian H. Hamley, Chirnside Park, and Joseph Korb, North Geelong, all of Australia, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 319,021

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041914

Int. Cl.³ G01F *23/26*

U.S. Cl. 73—304 C 13 Claims



1. A device for the capacitive measurement of liquid levels, particularly in an automobile tank, having a measurement sensor with measurement electrodes arranged concentric to each other and forming a measurement capacitor, the space between the measurement electrodes communicating at a variable height with the liquid to be measured, a channel within an inner of the measurement electrodes through which the liquid is drawn up, and compensation electrodes forming a compensation capacitor in a suction path of the liquid with a constant level of the liquid by which the influence of different dielectric constants of the liquid on the result of a measurement is compensatable in an evaluation circuit to which the measurement capacitor and the compensation capacitor are connected, the improvement comprising

a sump vessel having a bottom disposed lower than an upper opening of the channel within the inner measurement electrode,

the compensation electrodes arranged in said sump vessel,

an overflow in liquid-conducting communication with the channel and said sump vessel, and

a suction tube for the liquid extending substantially to the bottom of the sump vessel.

4,467,647

DIRECT READING TANK GAUGE

Kiyoshi E. Yamane, Los Angeles; Timothy C. Thomas, Tustin, and Jose J. Tostado, Fullerton, all of Calif., assignors to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.

Filed Sep. 30, 1982, Ser. No. 432,066

Int. Cl.³ G01F *23/12*

U.S. Cl. 73—321 11 Claims

1. A direct reading liquid level gauge comprising:

(a) a housing member adapted to be inserted into a tank;

(b) a float member slidably mounted on said housing member including magnetic means, said float member adapted to follow the surface of the fluid whose level is to be signalled;

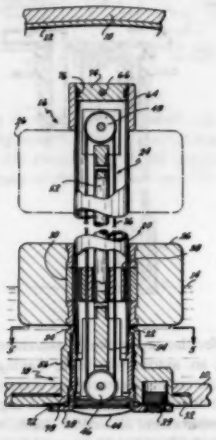
(c) endless display tape loop means having display indicia printed on the outer surface thereof, mounted in a display tape assembly within said housing member;

(d) armature means, permanently fastened to said endless

tape loop means and adapted to interact magnetically with said float member magnetic means;

(e) tape guide means including support rollers mounted within said housing member for allowing free movement of said tape loop means;

(f) window means, attached to said housing member and adjacent one of said support rollers for viewing said tape loop and the indicia printed thereon, said window means including hinge and latch means for opening said window means to provide access to said tape guide means; said support roller adjacent said window means including extended flanges, and



(g) removable retaining ring means for releasably retaining said display tape loop means, armature means and tape guide means within said housing member, whereby said window means, when opened, affords access to said retaining ring means for removal of the ring means and the entire display tape assembly, and whereby said support roller is manually actuable for restoring magnetic interaction between said armature means and said float member magnetic means, and whereby said display indicia corresponding to the position of said float member, and said armature means magnetically coupled thereto, are visible in said window means.

4,467,648

ELEVATOR FOR WATER EXAMINING INSTRUMENT

Toshihiko Sasaki, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00287, § 371 Date Mar. 2, 1983, § 102(e) Date Mar. 2, 1983

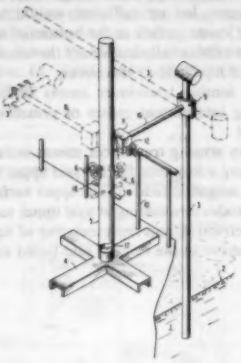
PCT Filed Jul. 27, 1982, Ser. No. 474,666

Claims priority, application Japan, Nov. 10, 1981, 56-180601

Int. Cl.³ G01D *21/00*

U.S. Cl. 73—432 R **2 Claims**

1. An elevator for a water examining instrument, including an elevator frame mounted on and movable up and down along an upright support structure and a water examining instrument supported by said elevator frame through an arm, said elevator being characterized in that said water examining instrument is supported rotatably about a first rotational axis extending in the longitudinal direction of said arm and a second rotational



axis extending in the direction of movement of said elevator frame.

4,467,649

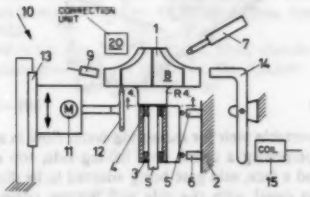
APPARATUS FOR BALANCING ROTATABLE BODIES

Richard Mueller, Lynchburg, Va., assignor to American Hoffmann Corporation, Lynchburg, Va.

Filed May 25, 1982, Ser. No. 381,841

Int. Cl.³ G01M *1/16*

U.S. Cl. 73—462 **6 Claims**



1. An apparatus for balancing a body scanned at predetermined positions in consideration of its shape and type comprising:

means for generating a phase reference signal representative of unbalance measurement during scanning of a body rotating at a measuring speed;

means using compressed air for driving the body at the measuring speed;

means for stopping the body after the measuring run at a position provided for mass correction, said position determined by said phase reference signal; and

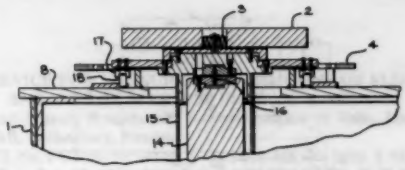
a braking device for braking the body after the measuring run to a speed less than the measuring speed so that an operative component of the means for stopping the body can be applied to the body to thereby stop the body, said braking device comprises a driving motor, and a friction wheel driven by the motor, the friction wheel being engageable with a surface of the body.

4,467,650

HARD STATIC BALANCING MACHINE

Gordon E. Hines; Ronald W. Anderson, and Arthur W. Henke, all of Ann Arbor, Mich., assignors to Hines Industries, Inc., Ann Arbor, Mich.

Filed Aug. 27, 1982, Ser. No. 412,166
Int. Cl.³ G01M 1/02
U.S. Cl. 73—483 7 Claims



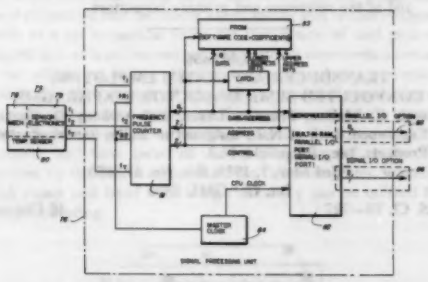
1. A hard suspension static balancing machine comprising, in combination, a stationary support member having an upper end and a lower end, said stationary support member defining a vertical axis, a vertical pivot rod mounted on such vertical axis adjacent said upper end of said stationary support member, a workpiece support fixture mounted on said vertical pivot rod, a rigid transmitting member attached to said workpiece support fixture and extending downwardly from said fixture, restoring spring means, independent of said vertical pivot rod and connected to said rigid transmitting member for restoring said workpiece support fixture, a control panel and measuring means adjacent said transmitting member for measuring workpiece displacement and communicating such displacement to such control panel.

4,467,651

METHOD FOR DETERMINING ACCELERATION

Rex B. Peters, Woodinville; Arnold Malametz, Carnation; Jeffrey F. Tonn, Tacoma; Charles K. Lee, Seattle; Aleksandar M. Gogic, Seattle, and Victor B. Corey, Bellevue, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 6, 1983, Ser. No. 456,255
Int. Cl.³ G01P 15/10
U.S. Cl. 73—497 6 Claims



1. In an accelerometer having dual proof masses sensitive to the same acceleration, with a pair of beam resonant force transducers, one connected with each proof mass for sensing the force induced in the proof mass by acceleration, the transducers having resonant frequencies f_1 and f_2 which vary oppositely with a change in acceleration, the improved method of determining the acceleration from the transducer frequencies in accordance with the relation

$$a = A_1 f_1 - A_2 f_2 + A_0$$

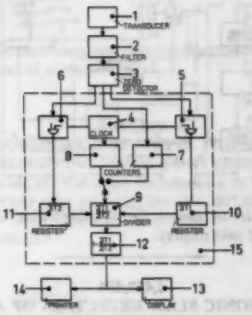
where A_1, A_2 and A_0 are calibration coefficients.

4,467,652

PROCEDURE AND DEVICE FOR COMPACTION MEASUREMENT

Geodynamik H. Thurner AB, Stockholm, and Ake Sandström, Sollentuna, both of Sweden, assignors to Geodynamik H. Thurner AB, Stockholm, Sweden

PCT No. PCT/SE81/00343, § 371 Date Jul. 23, 1981, § 102(e) Date Jul. 23, 1981, PCT Pub. No. WO82/01905, PCT Pub. Date Jun. 10, 1982
PCT Filed Nov. 25, 1981, Ser. No. 403,761
Claims priority, application Sweden, Nov. 26, 1980, 8008299
Int. Cl.³ G01N 3/52; E02D 3/046
U.S. Cl. 73—573 10 Claims



6. A device for measuring the degree of compaction attained when compacting a foundation with a compaction tool having a vibrating section which in contact with the foundation and moving along it compacts the foundation, comprising transducer means on the compaction tool for generating a submovement signal representing at least the most rapidly varying vertical component of the movement of the compacting section, means for sensing points in time when the submovement signal coincides with a reference value, in which connection the said reference value at least for the most part coincides with the mean value of the submovement signal, and function-forming means for the formation of a quantity as a function of the magnitude of the time interval between successive points in time during which the movement signal coincides with the reference value, which quantity comprises a measure of the degree of compaction.

4,467,653

METHOD AND APPARATUS FOR ULTRASONIC ANALYSIS

Jean-Pierre Turbe, Nanteuil-les-Meaux, France, assignor to Matix Industries S.A., France

Filed Mar. 26, 1982, Ser. No. 362,273
Int. Cl.³ G01N 29/00
U.S. Cl. 73—620 10 Claims

1. Apparatus for the ultrasonic analysis of a body comprising a container provided with a membrane to be applied against the body to be analyzed, said container being filled with an ultra-sound transmitting liquid;

means for producing a beam of ultrasound energy located in said container;

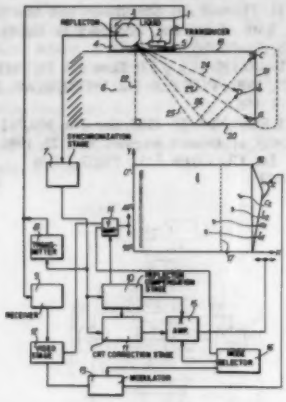
reflector means for reflecting said beam of ultrasound energy into the body through said membrane, said reflector means having a multifaceted, prismatic shape, said reflector means being disposed in said container;

driving means for driving said prismatic reflector in a continuous rotation around its symmetry axis;

means for displaying two orthogonal axes which correspond to distances and angles to be displayed;

means for receiving ultrasound energy reflected from said

body, and for providing an output signal representative thereof; and



electronic circuit means for synchronizing said reflector means and said display.

4,467,654

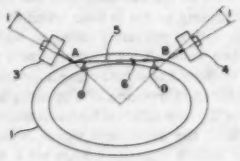
ULTRASONIC FLAW DETECTION OF A PIPE

Shinichi Murakami, Osaka; Junichi Sugitani, Hirakata, and Teruo Yoshimoto, Suita, all of Japan, assignors to Kubota, Ltd. and Osaka Gas Kabushiki Kaisha, both of Osaka, Japan

Continuation of Ser. No. 81,289, Oct. 2, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,452

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—640 **1 Claim**



1. A method of ultrasonic flaw detection of a pipe including a peripheral weld, comprising the steps of:

disposing a transmitter probe and a receiver probe adjacent the outer surface of a vertically standing pipe and suitably spaced from each other both in axial direction and in peripheral direction of the pipe,

continuously supplying water between said probes and the pipe outer surface,

receiving the supplied water flowing down the outer surface in a reservoir disposed downwardly and peripherally of the pipe,

providing ultrasonic radiation launched by the transmitter probe under proper angle of incidence into the pipe so that the ultrasonic radiation may pass straight from one point on the pipe outer surface through the material of the pipe and the peripheral weld to another point on the pipe outer surface, the ultrasonic radiation emerging out of the pipe being received by the receiver probe, and

scanning the pipe outer surface by a self-propelled scanner which moves the transmitter and receiver probes along the pipe outer surface keeping the proper relative disposing relation therebetween and which automatically stops upon contact with an object.

4,467,655

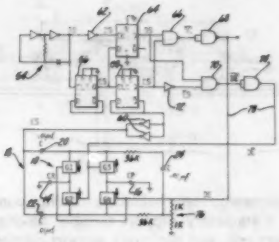
QUAD-GATE DEMODULATOR CIRCUIT FOR CAPACITIVE TRANSDUCERS

Chen Y. Lee, Troy, Mich., assignor to C & J Industries, Inc., Troy, Mich.

Filed Sep. 23, 1982, Ser. No. 422,234

Int. Cl.³ G01L *19/04*; H03K *9/02*

U.S. Cl. 73—724 **12 Claims**



1. A quad-gate demodulator circuit for use with a capacitive transducer of the type having a reference capacitor (C_r) and a primary capacitor (C_p) which vary differently in response to a quantity being measured wherein the improvement comprises:

an alternating excitation voltage source (**18**);

first and second analog gate means (**G1,G4**) interconnecting the source with the reference and primary capacitors to charge the capacitors during one polarity of the excitation voltage;

third and fourth analog gate means (**G2,G3**) interconnecting the source with the reference and primary capacitors to discharge the capacitors during the other polarity of the excitation voltage;

control signal generator means (**78**) connected to said analog gate means for rendering the first and second gate means simultaneously conducting for a first time period which is synchronized with said one excitation voltage polarity and for rendering the third and fourth gate means conducting for a second time period which is synchronized with the other excitation voltage polarity; and

output means (**24**) connected to said gate means for developing an output voltage related to the capacitance differential of the reference and primary capacitors.

4,467,656

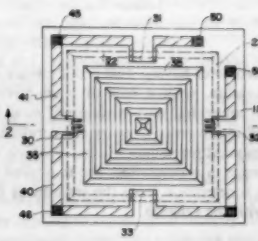
TRANSDUCER APPARATUS EMPLOYING CONVOLUTED SEMICONDUCTOR DIAPHRAGMS

Joseph R. Mallon, Franklin Lakes, and Anthony D. Kurtz, Englewood, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Mar. 7, 1983, Ser. No. 472,850

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—727 **10 Claims**



1. A pressure transducer, comprising:

a convoluted semiconductor diaphragm member having a central portion manifesting a plurality of concentric recesses forming a series of convolutions and an outer nondeflecting peripheral area

at least one semiconductor sensor deposited on said diaphragm within said peripheral area with a portion of said sensor being located proximate to an edge of an outer convolution.

4,467,657

DEVICE FOR MEASURING THE AMOUNT OF FLOW AND/OR THE SPEED OF FLOW OF A MEDIUM

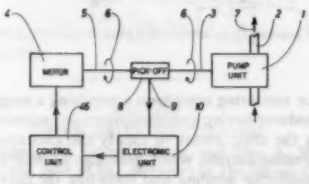
Bengt Olsson, Kungsbacka, Sweden, assignor to Telfa Jabsco AB, Gothenburg, Sweden

PCT No. PCT/SE80/00149, § 371 Date Jan. 20, 1982, § 102(e) Date Jan. 20, 1982, PCT Pub. No. WO81/03379, PCT Pub. Date Nov. 26, 1981

PCT Filed May 22, 1980, Ser. No. 346,058

Int. Cl.³ G01F 1/00

U.S. Cl. 73—861 **8 Claims**



1. A device for measuring the amount of flow and/or the speed of flow of a medium pumped by a pump unit, said device comprising: a drive motor for producing the working cycles of the pump unit, a pick-off operatively connected to said motor and pump unit for detecting said working cycles and for delivering a pick-off signal depending on said working cycles, an electronic unit operatively connected to said pick-off for recording, by means of said pick-off signal, a value proportional to the number of working cycles, from which value the amount of flow and/or the speed of flow can be determined by means of a nominal calibrating factor laid down for the pump unit, said electronic unit including a calibrating unit which is adjustable to a set numerical value for conversion of said pick-off signal into at least one output signal which represents a certain true calibrating factor calculated with the aid of a correction factor for the purpose of adapting the pick-off signal by correcting the nominal calibration factor by means of the correction factor, and also including devices for recording the amount and flow speed of the medium, adapted to be controlled by the output signal from the calibrating unit, whereby the pump unit itself with a high accuracy can be utilized for said measuring.

4,467,658

HYDRO RESISTANCE ANEMOMETER

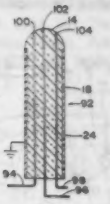
C. Michael Dube, Redondo Beach; George L. Donohue, San Pedro, and Ronald A. Blackwelder, Torrance, all of Calif., assignors to Dynamics Technology, Inc., Torrance, Calif.

Filed Mar. 9, 1982, Ser. No. 356,518

Int. Cl.³ G01F 1/64

U.S. Cl. 73—861.08 **1 Claim**

1. A sensor for a hydro resistance anemometer comprising an encapsulating dielectric defining a blunt sensor end for disposition upstream toward a flowing fluid and having a hemispherical shape, a plurality of driving electrodes encapsulated in and laterally covered by said dielectric and having exposed tips uniformly located about the hemispherical surface of said blunt sensor end, and an electrically conductive reference electrode encircling said driving electrodes and bounding said hemispherical surface.



4,467,659

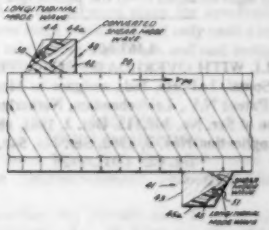
TRANSDUCER HAVING METAL HOUSING AND EMPLOYING MODE CONVERSION

Joseph Baumoel, 107 Columbia Dr., Jericho, N.Y. 11753

Filed Aug. 12, 1982, Ser. No. 407,434

Int. Cl.³ G01F 1/66

U.S. Cl. 73—861.27 **14 Claims**



1. The process of applying ultrasonic energy to a metal conduit carrying a fluid; said conduit having a characteristic shear mode velocity for sonic energy which propagates axially along said conduit; said process comprising producing longitudinal mode sonic energy wave in a metallic transducer housing which is clamped to the exterior of said conduit; converting said longitudinal mode sonic energy wave into shear mode energy wave by internal reflection of said longitudinal mode sonic energy wave from a surface of said metallic transducer housing; and applying said shear mode sonic energy wave to said metal conduit; the angle of travel of said shear mode sonic energy wave relative to the axis of the conduit being such that the phase velocity of said shear mode sonic energy wave in said housing as it reaches the surface of said conduit equals the said shear mode velocity in said conduit.

4,467,660

TURBINE WHEEL FLOW MEASURING TRANSDUCER

Robert D. McMillan, Jr., 907 Shepherd Rd., Georgetown, Tex. 78626

Filed Mar. 29, 1982, Ser. No. 362,889

Int. Cl.³ G01F 1/06

U.S. Cl. 73—861.87 **18 Claims**

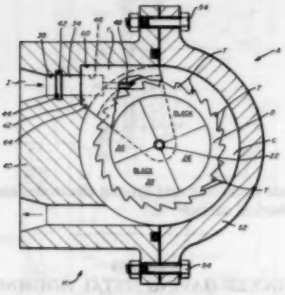
10. A rotatable apparatus for measuring low gas flow rates in the order of twenty milliliters per minute to ten thousand milliliters per minute at pressure drops in the order of twenty inches of water pressure or less in a flow meter of the type which includes a housing having a chamber through which the gas to be measured passes and a photoelectric circuit for mea-

suring relative movement of said apparatus as the gas passes through the housing, said apparatus comprising:

a disk adapted to be rotatably mounted in the chamber;

plural reaction turbine blades formed around the entire periphery of said disk for receiving the impact of substantially the entire flow of gas entering the chamber in a direction parallel to the plane wherein said disk is disposed sequentially against individual ones of said blades thereby presenting the adjacent blade; and,

reflective surfaces formed on portions of said disk for reflecting light directed from the photoelectric circuit.



4,467,661

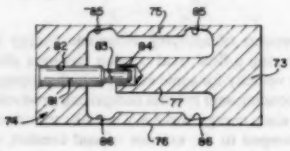
LOAD CELL WITH OVERLOAD PROTECTION SYSTEM

Hardev S. Somal, LaPorte, Ind., assignor to Maatschappij van Berkel's Patent N.V., Leidschendam, Netherlands

Continuation of Ser. No. 308,112, Oct. 2, 1981, abandoned. This application Nov. 3, 1983, Ser. No. 548,039

Int. Cl.³ G01L 1/26

U.S. Cl. 73—862.62 **4 Claims**



3. In a load cell for measuring forces applied thereto having an overload protection system, wherein said load cell comprises a fixed end constraint, a movable end constraint horizontally spaced from said fixed end constraint, upper and lower flexures horizontally extending between said end constraints, and means coacting with said end constraints and flexures for sensing stresses resulting from a load applied to said movable end constraint, the improvement being in said overload protection system which includes a single, substantially rigid cantilever member disposed between said flexures and extending from one of said end constraints toward the other of said end constraints to reduce the spacing between said end constraints, said member being integrally formed with said one end constraint, a pin extending from and having one end press-fit into an opening formed in the cantilever member or the opposing end constraint and being axially aligned with said cantilever member, stop means on the other of said end constraints or the cantilever member including an opening formed therein receiving the free end of the pin and limiting movement of said movable end constraint to thereby protect the load cell against overload, the end of said pin and said opening within which it is received being sized to define working gaps for restricting movement of said movable end constraint within the rated capacity of the sensing means.

4,467,662

SIGNAL RECTIFIER, ESPECIALLY FOR MAGNETOELASTIC TRANSDUCERS

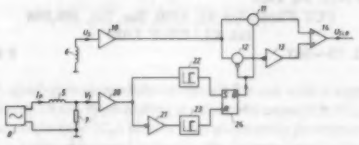
Stefan Valdemarsson, Västerås, Sweden, assignor to ASEA Aktiebolag, VästerÅs, Sweden

Filed Apr. 15, 1983, Ser. No. 485,392

Claims priority, application Sweden, Apr. 19, 1982, 8202432

Int. Cl.³ G01L 1/12

U.S. Cl. 73—862.69 **4 Claims**



1. Force measuring equipment comprising a magnetoelastic force transducer having a magnetic core, an excitation winding threading the core, means to supply the excitation winding with alternating current, which generates a primary flux in the core, a measuring winding also threading the core, in which measuring winding a secondary flux proportional to a force applied to the core, induces a signal voltage, and signal processing means including switchable polarity reversal means for generating an output signal by periodic polarity reversal of the signal voltage,

the improvement comprising

the signal processing means includes control means arranged to sense when the primary flux passes a positive and a negative reference level and to switch the polarity reversal means at the times during each period of the alternating current when the primary flux with a certain sign of its time rate of change passes the positive reference level and when the primary flux with the opposite sign of its time rate of change passes the negative reference level.

4,467,663

OVERLOAD COUPLINGS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 875,949, Feb. 7, 1978, abandoned. This application Oct. 22, 1980, Ser. No. 199,539

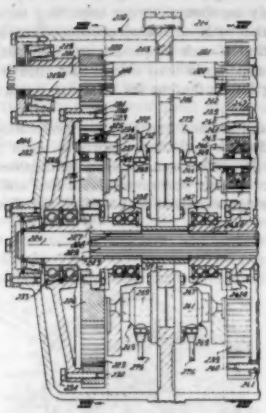
Claims priority, application Netherlands, Feb. 11, 1977, 7701444

Int. Cl.³ F16H 57/10; F16D 43/20

U.S. Cl. 74—15.4 **30 Claims**

7. An overload coupling in a gear transmission comprising an input shaft and at least one output shaft, a plurality of different sized gear wheels mounted on the input shaft and said wheels being selectively coupled to said output shaft through respective planetary gear systems, said coupling comprising hydraulic circuit means and displaceable plunger means in said circuit means, and said plunger means normally establishing a driving connection between the input and output shafts by engaging a respective carrier of either gear wheel until over-

load displaces said plunger means against hydrostatic pressure prevailing in said circuit means, said plunger means being



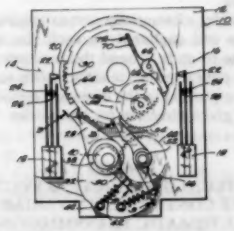
slideable within holder means and out of engagement with said respective carrier.

4,467,664

TIMER DRIVE MECHANISM

John Williman, Elk Grove Village, and Guy A. Wojtanek, Schiller Park, both of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Sep. 28, 1981, Ser. No. 306,208
Int. Cl.³ F16H *29/00*
U.S. Cl. 74—116 **9 Claims**



1. In a programmed switching device having a rotatable cam member provided with a plurality of cam tracks operating switches in sequence, the cam member including a drive ratchet engaged by a drive pawl, a motor, and drive means connecting the motor to the drive pawl and reciprocating the drive pawl a finite distance, the improvement comprising,

a second pawl driven and reciprocated by said motor,

a second ratchet engaged by said second pawl,

a first gear on said cam member, a second gear on said second ratchet, said first and second gears drivingly connected

some of the drive ratchet teeth being spaced more than said finite distance whereby the drive pawl is unable to advance the drive ratchet until the next tooth has been advanced to a position in which it can be engaged by the drive pawl,

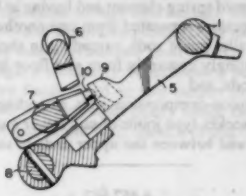
the second pawl and second ratchet being operative to advance the cam member to said position in which the drive pawl can engage the next tooth on the drive ratchet to advance the cam member.

4,467,665

SYNCHRONIZING DEVICE FOR TRANSMISSION

Nobuaki Katayama; Yukio Terakura; Kazuhito Ikemoto, all of Toyota, and Kan Sasaki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 24, 1981, Ser. No. 257,138
Claims priority, application Japan, Feb. 17, 1981, 56-21951
Int. Cl.³ F16H *3/38*; B60K *41/26*
U.S. Cl. 74—339 **9 Claims**



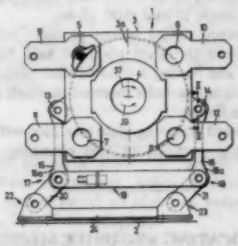
1. A synchronizing device for a transmission which is operative to effect reverse shift by actuating fork shafts of the transmission forward stages and obtain synchronizing of a counter gear with an output shaft in rotation by means of a synchronating device of the forward stage, characterized in that a shift and select lever has a projection formed with an inclined surface which comes into contact with a spring-loaded pin provided on one of said fork shafts of the forward stages to actuate said fork shaft of the forward stage for synchronizing only when the reverse stage is selected and only until a compressive force between said spring-loaded pin and said inclined surface reaches a predetermined value.

4,467,666

TORQUE SUPPORT

Wilhelm Ackermann, Essen, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 238,689, Feb. 27, 1981, abandoned.
This application Apr. 27, 1981, Ser. No. 257,574
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007916
Int. Cl.³ F16H *57/00, 37/06*
U.S. Cl. 74—411 **8 Claims**



1. A torque support apparatus positioned above floor level comprising:

(a) a shaft pivot;

(b) a driving sprocket gear non-rotatably mounted on said shaft pivot;

(c) a gear box supported on said shaft pivot;

(d) at least one drive motor secured to said gear box;

(e) each of said drive motors being provided with reduction gearing and a pinion gear;

(f) each of said pinion gears meshing with said sprocket gear;

(g) parallel steering rods rotatively attached on opposide sides of said gear box by ball and socket-type joints, said

steering rods being equally spaced from said gear box and having upper and lower ends;

(h) parallel and equal in length guide rods, each having upper and lower ends, the upper ends of said guide rods being attached, by ball and socket-type joints, to the lower ends of steering rods, the lower ends of said guide rods being stationarily arranged, by ball and socket joints;

(i) at least one tension-compression rod inter-connecting said parallel guide rods, said rods having at least one internally-positioned spring element and having at least two longitudinal sections separated from one another by a gap;

(j) said parallel guide rods, extending in their normal position, slantingly upwardly from said floor level at an angle to said rods; and

(k) said tension-compression rods extending between said ball and socket-type joints of said lower ends of said steering rods and between the upper ends of said guide rods.

4,467,667

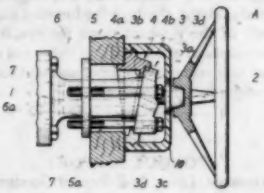
FITTING STRUCTURE OF STEERING WHEEL MECHANISM

Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System, Inc., Hyogo, Japan

Filed Feb. 11, 1982, Ser. No. 348,152

Int. Cl.³ B62D 1/18

U.S. Cl. 74—493 **2 Claims**



1. A fitting structure for a steering wheel mechanism to a dashboard comprising:

a casing:

a flange provided to a top end of said casing, having a slant plane with a suitable angle against the axial direction of a steering wheel shaft, having at least two vertical clamping bores perforated in parallel with the axial direction of said shaft, and having at least two slant clamping bores perforated at an angle to said slant plane;

a nearly C-shaped setting holder partially cut away, interposed between the slant plane of said flange and said dashboard, and having a suitable slant plane;

at least two clamping bolts inserted through said clamping bores of the flange;

a nearly U-shaped clamping plate provided with screw bores in which top portions of said clamping bolts can be screwed.

4,467,668

RECIPROCATING ARC-DRIVE MECHANISM

Fred G. Tatch, 1656 Walnut St., Eugene, Oreg. 97403

Filed Nov. 30, 1982, Ser. No. 445,478

Int. Cl.³ G05G 1/14

U.S. Cl. 74—594.2 **14 Claims**

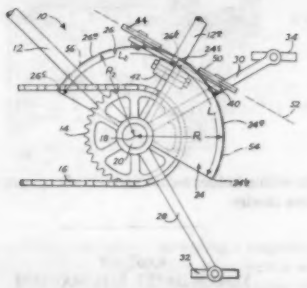
1. Reciprocating arc-drive mechanism for use in a vehicle having a frame, a drive wheel mounted on the frame, and a pair of torque-imparting means attached to the wheel and rotatable independently for imparting alternately a torque in a known direction on the wheel when rotated in one direction and for imparting substantially no torque when rotated in the opposite direction, said mechanism comprising

a pair of spaced-apart sheave portions attachable rotatably about known axes to such a frame, each portion having a generally arcuate rim disposed a known radial distance from the respective axis of rotation,

means for drivingly connecting said sheave portions to such previously mentioned torque-imparting means in such a manner that rotation of each portion effects a corresponding rotation of each torque-imparting means,

means attached to at least one of said sheave portions for applying forces thereto for effecting reciprocal rotation thereof,

first, second, third and fourth pulley means attachable to the frame adjacent said sheave portions, each pulley means having a generally circular perimeter disposed adjacent an associated sheave portion rim, said first and third pulley means being associated with one of said sheave portions,



and said second and fourth pulley means being associated with the other portion,

a first flexible, substantially non-extensible, element having one end anchored on each rim and extending, intermediate its ends, around the perimeters of said first and second pulley means, said first element, when tensed, tending to rotate each sheave portion in a given direction for the portion, and

a second flexible, substantially non-extensible, element also having one end anchored on each rim and extending, intermediate its ends, around the perimeters of said third and fourth pulley means, tending, when tensed, to rotate each sheave portion in the direction opposite the above-mentioned given direction for the portion.

4,467,669

WORKING FLUID DISTRIBUTING SYSTEM FOR A BELT DRIVE CONTINUOUSLY-VARIABLE SPEED AUTOMATIC TRANSMISSION

Mutsumi Kawamoto, Nagoya, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Jan. 26, 1982, Ser. No. 342,967

Claims priority, application Japan, Feb. 7, 1981, 56-17072

Int. Cl.³ F16H 47/04, 37/00, 9/00

U.S. Cl. 74—688 **2 Claims**

1. A working fluid distributing system for a belt drive continuously-variable speed automatic transmission, comprising:

a housing;

a fluid coupling;

an input shaft connected to the output end of said fluid coupling;

a supporting collar penetrating perpendicularly through and attached to a wall portion of said housing being positioned perpendicularly to the axis of said input shaft, and adapted to rotatably support the input end of said fluid coupling on the exterior surface thereof and to rotatably support said input shaft on the interior surface thereof;

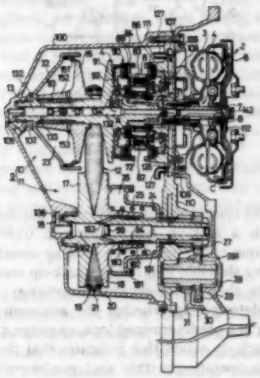
an intermediate shaft arranged coaxially with said input shaft and rotatably supported on said input shaft at one end thereof and on said housing at the other end thereof;

an output shaft supported rotatably on said housing in paral-

lel with said intermediate shaft as well as to said input shaft;

a belt drive continuously-variable speed transmission means comprising a primary variable-pitch pulley including a fixed pulley flange fixed concentrically to said intermediate shaft and a movable pulley flange being slidable axially and relatively to said fixed pulley flange, a secondary variable-pitch pulley including a fixed pulley flange fixed concentrically to said output shaft and a movable pulley flange being slidable axially and relatively to said fixed pulley flange, and an endless belt extended between said primary and said secondary variable-pitch pulleys for interconnecting said primary and said secondary pulleys and for transmitting the rotation of the intermediate shaft to the output shaft and changing the rotational speed ratio between said intermediate shaft and said output shaft;

a change direction gear train mounted on one of said input shaft and said intermediate shaft, connected to said input



shaft at the input end thereof and to said intermediate shaft at the output end thereof and adapted to rotate the output shaft to a direction the same with the rotational direction of the intermediate shaft or to rotate the output shaft to a direction reverse to the rotational direction of the intermediate shaft by the operation of a clutch or a brake being operated by a hydraulic servomechanism engaged thereto, respectively;

a plurality of pockets formed independently in the interior surface of said supporting collar along the circumferential direction;

a cylindrical member fitted in the axial bore of said supporting collar for separating said pockets from each other; and

fluid passages formed in said housing radially of said supporting collar as to communicate with said pockets, said pockets being connected with respective fluid passages and communicating with at least said fluid coupling and said hydraulic servomechanism for operating at least one of said clutch and said brake.

4,467,670

BELT DRIVE CONTINUOUSLY-VARIABLE SPEED AUTOMATIC TRANSMISSION

Mutsumi Kawamoto, Aichi, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Jan. 26, 1982, Ser. No. 342,968

Claims priority, application Japan, Feb. 4, 1981, 56-15344

Int. Cl.³ F16H *37/00, 9/00*

U.S. Cl. 74—689 **8 Claims**

1. A belt drive continuously-variable speed automatic transmission comprising:

a housing;

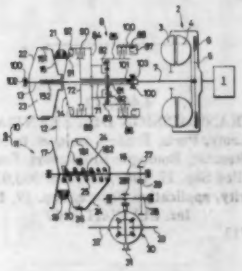
an input shaft;

an intermediate shaft supported coaxially with and rotatably relative to said input shaft;

first means to rotatably support one end of said intermediate shaft, second means carried by said input shaft to rotatably support the other end of said intermediate shaft;

an output shaft supported in said housing in parallel with said input shaft and said intermediate shaft;

a belt drive continuously-variable speed transmission means including a primary variable-pitch pulley having a fixed pulley flange fixed to said intermediate shaft concentrically thereto and a movable pulley flange mounted axially slidably on said intermediate shaft relative to said fixed pulley flange, a secondary variable-pitch pulley having a fixed pulley flange fixed to said output shaft concentrically thereto and a movable pulley flange mounted axially slidably on said output shaft relative to said corresponding



pulley flange, and an endless belt extended between said primary and secondary variable-pitch pulleys for varying the transmission ratio between said intermediate shaft and said output shaft by varying the respective working radial positions on said primary variable-pitch pulley and said secondary variable-pitch pulley;

a clutch interposed between said input shaft and said intermediate shaft and adapted to couple said intermediate shaft with said input shaft; and

a change-direction gear train with the input end thereof being connected to said input shaft, with the output end thereof being connected to said intermediate shaft, and capable of attaining forward drive and reverse drive; and

said primary variable-pitch pulley and said change-direction gear train being placed between said two supporting means for supporting both ends of said intermediate shaft in said housing.

4,467,671

RELEASE MECHANISM FOR A PUSH-BUTTON TUNER

Hiroyasu Miyata, Furukawa; Keizo Watanabe, and Akio Yamaguchi, both of Iwaki, all of Japan, assignors to Sanshin Electric Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,751

Claims priority, application Japan, Feb. 18, 1981, 56-21694

Int. Cl.³ H03J *5/12;* F16H *1/18*

U.S. Cl. 74—10.85 **3 Claims**

1. A clutch mechanism of a push-button tuner, comprising:

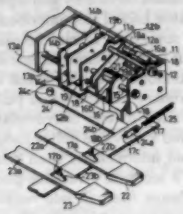
a manual tuning shaft having a threaded portion,

a reaction plate movably and turnably installed on a guide rod disposed in parallel with said manual tuning shaft, said reaction plate being provided with a friction pad corresponding to said threaded portion,

a core carriage movable in the same direction as a moving direction of said reaction plate in interlocking movement therewith, thereby to execute variable tuning, and

a release plate operated by depressing a push button,

said friction pad and said threaded portion being normally held in engagement,



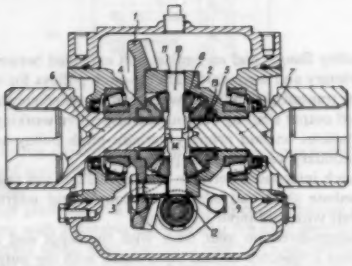
the engagement being released when said push button is depressed.

4,467,672

TRANSMISSION DIFFERENTIAL

Jean-Michel Lamy, Paris, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 17, 1981, Ser. No. 303,022
Claims priority, application France, Sep. 19, 1980, 80 20211
Int. Cl.³ F16H *1/40*
U.S. Cl. 74—713 **3 Claims**



1. A transmission differential comprising:

a case assembly mounted for rotation about a main axis and including a case body and a case closure;

a first sun wheel assembly mounted in said case body for rotation about said main axis and including a first bevel sun gear and a first axle shaft drivingly connected thereto;

a second sun wheel assembly mounted in said case closure for rotation about said main axis and including a second bevel sun gear and a second axle shaft drivingly connected thereto;

a single planet gear pin mounted in two opposed through holes provided in said case body in a direction perpendicular to said main axis;

two bevel planet gears rotatably mounted on said planet gear pin each in meshing engagement with both said first and said second bevel sun gears;

a circular groove defining a bottom wall and two side walls in said planet gear pin; and

a circular peg carried by said second sun wheel assembly and having its outer periphery in engagement with said side walls of said planet gear pin,

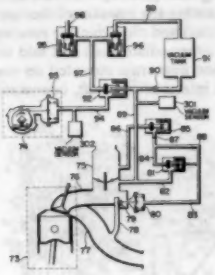
whereby when said case closure is in place on said case body, with said second sun wheel assembly mounted in said case closure, said planet gear pin is prevented from axial movement in said through holes of said case body.

4,467,673

CONTROL SYSTEM FOR ENGINE OF AUTOMOTIVE VEHICLE EQUIPPED WITH LOCK-UP TYPE AUTOMATIC TRANSMISSION

Hideo Hamada; Yoshiro Morimoto, both of Yokosuka; Masaaki Suga, Yokohama; Masaaki Futagi, and Tadashi Suzuki, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 29, 1981, Ser. No. 268,323
Claims priority, application Japan, Jun. 2, 1980, 55-726672
Int. Cl.³ B60K *41/02*
U.S. Cl. 74—860 **10 Claims**



10. A control system for an engine of an automotive vehicle equipped with a lock-up type automatic transmission that includes a torque converter with a lock-up clutch, the torque converter being shiftable into either a lock-up state or a torque converter state, the control system comprising:

means for determining whether the automotive vehicle is operating in a predetermined lock-up range and for generating a lock-up signal that indicates that the automotive vehicle is operating within said predetermined lock-up range;

means responsive to the presence of said lock-up signal for operating said lock-up torque converter in the lock-up state;

exhaust gas recirculation control means responsive to the absence of said lock-up signal for varying the amount of exhaust gas recirculation in a first pattern which provides suitable exhaust gas recirculation for operating of the engine when the lock-up torque converter operates in the torque converter state, and responsive to the presence of said lock-up signal for varying the amount of exhaust gas recirculation in a second pattern which provides suitable exhaust gas recirculation for operation of the engine when the lock-up torque converter operates in the lock-up state;

ignition timing control means responsive to the absence of said lock-up signal for varying a spark timing in a first pattern which provides suitable spark timing for operation of the engine when the torque converter operates in the torque converter state, and responsive to the presence of said lock-up signal for varying a spark timing in a second pattern which provides suitable spark timing for operation of the engine when the torque converter operates in the lock-up state;

said exhaust gas recirculation control means comprising:

an exhaust gas recirculation conduit having an EGR valve for controlling flow of exhaust gas through said exhaust gas recirculation conduit;

an EGR diaphragm device for actuating said EGR valve for controlling the opening of said EGR valve;

a three-way valve;

an atmospheric air admission valve, an EGR vacuum passage having one end opening into said three-way valve and another end opening into said EGR diaphragm device;

a manifold vacuum passage having one end opening into said

three-way valve and another end opening into a carburetor for the engine at a position where intake manifold vacuum builds up;

a dilution passage having one end opening into said three-way valve and another end opening into said atmospheric air admission valve;

an atmosphere passage having one end opening into said atmospheric air admission valve and another end opening to the atmosphere;

a bypass passage having one end opening into said EGR vacuum passage and another end opening into said dilution passage;

said three-way valve having a solenoid and valve means for normally establishing communication between said one end of said EGR vacuum passage and said one end of said manifold vacuum passage when said solenoid thereof is not energized and for establishing communication between said one end of said EGR vacuum passage and said one end of said dilution passage when said solenoid thereof is energized;

said atmospheric air admission valve having a solenoid and valve means for preventing communication between said another end of said dilution passage and said another end of said atmosphere passage when said solenoid thereof is not energized and for establishing communication between said another end of said dilution passage and said one end of said atmosphere passage when said solenoid thereof is energized; and

means responsive to the presence of said lock-up signal for energizing said solenoid of said three-way valve and periodically energizing said solenoid of said atmospheric air admission valve.

4,467,674

CONTROL OF AN INFINITELY VARIABLE TRANSMISSION OF A MOTOR VEHICLE

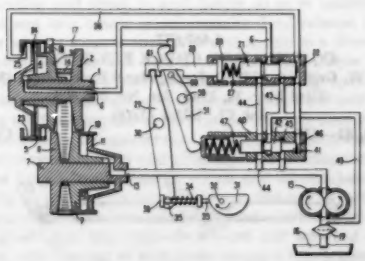
Petrus H. van Deursen, Deurne, and Frederik E. C. van der Hardt Aberson, Nuenen, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Continuation of Ser. No. 28,853, Apr. 10, 1979, abandoned. This application Apr. 8, 1981, Ser. No. 252,195

Claims priority, application Netherlands, May 3, 1978, 7804737

Int. Cl.³ B60K *41/12, 41/16*

U.S. Cl. 74—867 **4 Claims**



1. Apparatus for controlling the transmission ratio of a motor vehicle transmission of the infinitely variable ratio type including a belt and two pulleys, each pulley having conical discs which are hydraulically movable toward and away from each other, said apparatus comprising hydraulic valve means including an axially movable internal pilot slide for supplying and exhausting hydraulic fluid to the movable pulley discs to effect movement thereof, first means responsive to actual engine speed for urging said slide in one direction, second means responsive to desired engine speed for applying an urging force on said slide in an opposite direction, and third means for limiting the resulting urging force on said slide in said opposite direction, said third means being responsive to the transmission ratio.

4,467,675

SHIFT DEVICE FOR HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

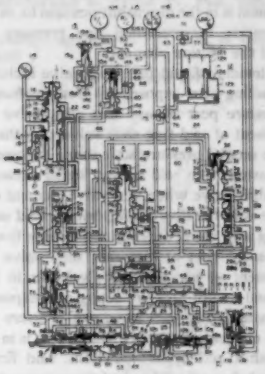
Kazuhiko Sugano, and Kazuyoshi Iwanaga, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 24, 1982, Ser. No. 351,747

Claims priority, application Japan, Feb. 28, 1981, 56-27664

Int. Cl.³ B60K *41/08, 41/12*

U.S. Cl. 74—869 **8 Claims**



1. A hydraulic control system for an automatic transmission for a motor vehicle having an internal combustion engine with a throttle valve, the automatic transmission including at least one forward drive gear ratio lower than at least one other forward drive gear ratio, the transmission including a plurality of friction elements including a friction element for contributing to shifting between the one forward drive gear ratio and the one other forward drive gear ratio, the hydraulic control system comprising:

a first shift valve having a housing with a wall portion defining a valve bore;

a second shift valve having a housing with a wall portion defining a valve bore;

line pressure generating means for delivering a line pressure to said first shift valve;

first signal pressure generating means for delivering a first signal pressure to said first and second shift valves;

second signal pressure generating means for delivering a second signal pressure to said first and second shift valves;

kickdown pressure generating means for delivering a kickdown pressure to said first shift valve;

said first shift valve including a line pressure inlet port, a line pressure outlet port, a first signal pressure port, a second signal pressure port receiving said second signal pressure and a kickdown pressure port receiving kickdown pressure, said line pressure inlet and outlet ports, said first signal pressure and second signal pressure ports, and said kickdown pressure port being disposed in said wall portion of said first shift valve;

said line pressure inlet and outlet ports being selectively communicating with each other;

said second shift valve including a signal pressure inlet port receiving said second signal pressure, and a signal pressure outlet port communicating with said first signal pressure port of said first shift valve, said signal pressure inlet and signal pressure outlet ports being disposed in said wall portion of said second shift valve;

said signal pressure inlet and outlet ports of said second shift valve selectively communicating with each other;

said first shift valve including a valve element movable within said valve bore of said first shift valve between a downshift position and an upshift position;

said valve element of said first shift valve including means for effecting communication between said line pressure inlet and outlet ports when said valve element of said first shift valve is in the upshift position to, in turn, effect communication between said line pressure generating means and the friction element to establish the one forward drive gear ratio, said valve element of said first shift valve also including means for blocking communication between said line pressure inlet and outlet ports when said valve element is in the downshift position to, in turn, block communication between said line pressure generating means and the friction element;

said valve element of said first shift valve including a first pressure acting area exposed to pressure from said first signal pressure port of said first shift valve when said valve element of said first shift valve is in the downshift position, a second pressure acting area exposed to second signal pressure from said second signal pressure port of said first shift valve when said valve element of said first shift valve is in the downshift position, said second pressure acting area being exposed to pressure from said first signal pressure port of said first shift valve when said valve element of said first shift valve is in the upshift position, and a third pressure acting area exposed to kickdown pressure from said kickdown pressure port when said valve element of said first shift valve is in any one of the downshift and upshift positions, said first pressure acting area being exposed to kickdown pressure from said kickdown pressure port when said valve element of said first shift valve is in the upshift position, said valve element of said first shift valve having an end pressure acting area exposed to said first signal pressure from said first signal pressure generating means when said valve element of said first shift valve is in any one of the downshift and upshift positions,

said second shift valve including a valve element movable in said valve bore of said second shift valve between first and second positions;

said valve element of said second shift valve including means for effecting communication between said signal pressure inlet and signal pressure outlet ports of said second shift valve when said valve element of said second shift valve is in the first position to, in turn, effect communication between said second signal pressure generating means and said first signal pressure port of said first shift valve, said valve element of said second shift valve further including means for blocking communication between said signal pressure inlet and signal pressure outlet ports of said second shift valve when said valve element of said second shift valve is in the second position to, in turn, block communication between said second signal pressure generating means and said first signal pressure port of said first shift valve;

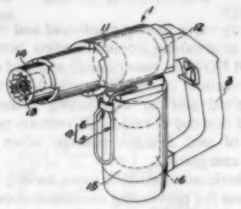
said valve element of said second shift valve further including a first pressure acting area exposed to second signal pressure from said signal pressure inlet port of said second shift valve when said valve element of said second shift valve is in the first position and a second pressure acting area exposed to second signal pressure from said signal pressure inlet port when said valve element of said second shift valve is in the second position, said valve element of said second shift valve having an end pressure acting area exposed to said first signal pressure from said first signal pressure generating means.

4,467,676

BOLT TIGHTENING DEVICE HAVING AUXILIARY HANDLE

Seiji Ikeda, Osaka; Katsuyuki Ono, Moriguchi, and Shozo Matsumura, Toyonaka, all of Japan, assignors to Maeda Metal Industries, Ltd., Osaka, Japan

Filed Jul. 13, 1982, Ser. No. 397,928
Claims priority, application Japan, Feb. 25, 1982, 57-28194[U]
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—56 **10 Claims**



1. A bolt tightening device comprising:

a main body including a tubular case having a longitudinal axis;

a housing attached to the base end of said case approximately at a right angle therewith;

a main handle extending from the base end of said case to the outer end of said housing;

a pair of slide guide portions formed on opposite sides of said case at its junction with said housing and extending parallel to said axis, said slide guide portions each having positioning portions formed at each end of thereof; and

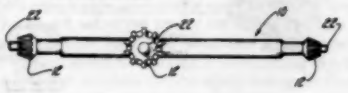
an auxiliary handle comprising a grip member extending parallel to said housing and having a pair of parallel clamp pieces extending perpendicular therefrom, one of said clamp pieces being engaged in each of said slide guide portions, said clamp pieces being provided with engaging means at their ends for engaging said positioning portions, and means for adjustably engaging said engaging means with said positioning portions at either end of said slide guide portions whereby said auxiliary handle may be selectively moved between a withdrawn position and a pushed-in position.

4,467,677

COMBINATION CHUCK KEY TOOL

Daniel W. Grifford, 1237 E. Jarvis, Hazel Park, Mich. 48030

Filed Mar. 28, 1983, Ser. No. 479,695
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—439 **17 Claims**



1. A combination tool comprising a multiplicity of tool shafts rigidly affixed to one another, each of said shafts having opposing ends, and each of said ends carrying a tool instrumentality thereon, wherein at least two of said instrumentalities comprise chuck keys, each of said chuck keys comprising a key shaft portion; wherein one of said shafts is of a larger diameter than each of the others of said shafts, said larger diameter shaft comprising a first portion defining an axial throughbore therein, said axial throughbore having a diameter at least equal to the largest diameter of each of the others of shafts; and wherein the key shaft portion of at least one of said chuck keys is fixedly secured in said axial throughbore; said larger diame-

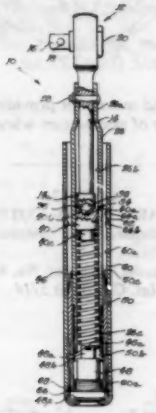
ter shaft comprising a second portion defining a diametric throughbore therein, one of the others of said shafts being affixed in said diametric throughbore.

4,467,678

TORQUE WRENCH

Wayne R. Lindholm, Palatine, Ill., assignor to Frank G. Eskuchen, Coral Gables, Fla.; Leonard G. Eskuchen, Arlington Heights and Raymond F. Eskuchen, Glenview, both of, Ill.

Filed Aug. 27, 1982, Ser. No. 412,126
Int. Cl.³ B25B *23/142*
U.S. Cl. 81—483 **9 Claims**



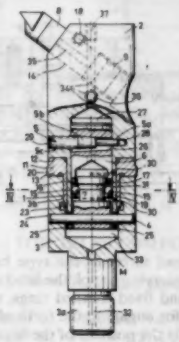
1. In a torque wrench including a drive head defining a torque transfer axis and adapted to transfer torque to a workpiece and the like, a shank connected to said drive head so as to lie in a plane substantially normal to said torque transfer axis and having a free end spaced from said drive head, a tubular handle disposed generally coaxially over said shank and pivotally connected thereto for pivotal movement relative to said shank about a pivot axis substantially transverse to the longitudinal axis of said shank, and coupling means releasably interconnecting said shank to said handle so as to maintain said shank and said handle in substantially fixed relation to each other when a force is applied to said handle in a direction to establish a torque less than a predetermined torque at said torque transfer axis, said coupling means being operative to enable relative movement between said shank and said handle when the force applied to said handle effects a torque at said torque transfer axis greater than said predetermined torque; the improvement wherein said coupling means comprises a follower longitudinally slidable within said tubular handle and having an end surface opposed to said free end of said shank, means cooperative with said handle and said follower so as to selectively bias said follower toward said free end of said shank, said free end of said shank having a first semispherical recess of a predetermined diameter and depth formed therein, said end surface of said follower having a second generally semispherical recess of said predetermined diameter but of a depth less than the depth of said first recess, and a spherical coupling member mutually received within said first and second recesses and having a diameter substantially equal to said predetermined diameter, said spherical member being cooperative with said shank and said follower so as to maintain said shank and handle in substantially fixed relation until a predetermined torque is established at said drive head whereupon said spherical member cams said follower away from said free end of said shank to enable pivotal movement of the handle relative to the shank and cause said shank to engage the inner surface of said tubular handle to effect an audible indication that said predetermined torque has been reached.

4,467,679

TOOL HEAD

Frank Johne, Hopener Strasse 24, Lohne, Fed. Rep. of Germany (D-2842); Hans G. Hartkamp, Nordstrasse 40, Beckum, Fed. Rep. of Germany (D-4720), and Hans-Georg Burmester, Suarezstrasse 8, Berlin 19, Fed. Rep. of Germany D-1000

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128047
Int. Cl.³ B23B *29/10*
U.S. Cl. 82—36 R **13 Claims**



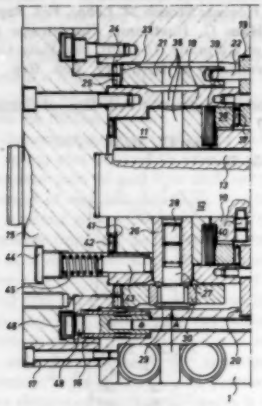
1. A tool head comprising:
a base member adapted to be attached at one end to a machine tool;
a contact surface on the other end of said base member;
a cylindrical bore in said base member open at said other end;
a cylindrical sleeve rotatably supported in said bore;
a flange on said sleeve slidably engaging said contact surface on said base member;
a cylindrical eccentric bore in said sleeve having its central axis eccentric to the axis of said cylindrical bore in said base member;
a tool holder having one end in said eccentric bore and having a tool mounting means at the other end;
means to prevent relative rotation and allow relative transverse displacement between said tool holder and base member;
a support surface on said tool holder slidably engaging said flange on said eccentric sleeve;
said flange being disposed between said contact surface on said base member and said support surface on said tool holder;
axial clamping means operatively mounted within said tool holder to clamp said tool holder and eccentric sleeve to said base member to prevent relative axial displacement thereof;
means for actuating said axial clamping means; and
radial clamping means operatively disposed within said cylindrical bore in said base member to clamp said tool holder and eccentric sleeve to said base member to prevent relative rotation thereof in response to actuation of said axial clamping means.

4,467,680

TOOL TURRET WITH REVOLVING HEAD

Hans Kettel, Riederich, Fed. Rep. of Germany, assignor to Sauter Feinmechanik GmbH, Metzingen, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,662
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1981, 3134969
Int. Cl.³ B23B *29/32*
U.S. Cl. 82—36 A 5 Claims



5. A rotatable tool turret of the type having a housing, a rotatable head for carrying a tool, the head and housing having coaxial rotatable and fixed toothed rings, respectively, and a locking apparatus for engaging the teeth of the rings to selectively release and fix the position of the head at any of a plurality of positions, wherein the locking apparatus comprises

an annular axially movable locking member having at one end thereof axially facing teeth directed toward and engageable concurrently with the teeth on the rotatable and fixed rings;

cam means for controlling the axial movement of said locking member including a cam aperture in said locking member and a guide member connected to said head and engaging said aperture, said cam aperture being driven and having peripherally extending central cam surface portions and obliquely extending end cam surface portions; and

means for angularly moving said guide member relative to said aperture.

4,467,681

CHUCK MECHANISM

Joseph A. Oeming, 220 Reynick, Saginaw, Mich. 48602

Filed Feb. 5, 1981, Ser. No. 231,733
Int. Cl.³ B23B *31/02, 31/18*
U.S. Cl. 82—40 A 11 Claims

1. A chuck mechanism for stably supporting a workpiece during a machining operation upon the workpiece comprising:

a frame;

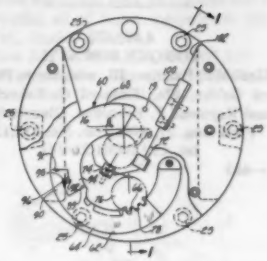
at least one workpiece support secured to said frame;

an arcuate clamping jaw on said frame; and

means on said frame for reversibly displacing said clamping jaw between a first rotational position in which said jaw is spaced apart from said workpiece support whereby a workpiece can be placed between said jaw and said at least one support, and a second rotational position, in which said jaw presses said workpiece against said at least one support,

wherein said frame includes an annular channel in which said clamping jaw is annularly slidably mounted, and

wherein said jaw further comprises two annular sectors, positioned circumferentially adjacent each other in said channel, one of said sectors being displaced by said means for displacing and means for enabling only limited movement between said sectors for providing a sudden impact against the other of said sectors when said one sector is displaced.

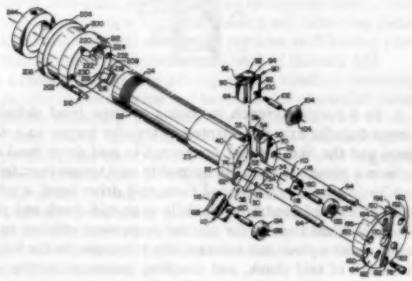


4,467,682

ROTARY TUBING CUTTER

Ronald D. Huggins, Bullard, Tex., assignor to Anvil Corporation, Jacksonville, Tex.

Filed Sep. 30, 1982, Ser. No. 431,711
Int. Cl.³ B23B *5/14*
U.S. Cl. 82—73 4 Claims



1. A tube cutoff device comprising:

a rotatable shaft member having three hubs extending therefrom to define three angularly spaced radial guideways between said hubs at the mouth of said shaft member;

three radially slidable tube contact means slidable within said radial guideways;

actuator means having a sleeve portion and three actuating arms for registering in the outer portion of said guideways for engaging said tube contact means, the surfaces on said actuating arms cooperating with said tube contact means to force said contact means radially inwardly when said actuator means is moved relative to said shaft member;

a cutter means on one of said tube contact means for cutting a pipe positioned within said device; and

roller means on the other two tube contact means for engaging said tube during the cutting operation;

the outer end of the tube contact means having the cutter means thereon comprising a ramp having a T-section extending therefrom and said actuating arm engaging said cutter tube contact means comprising a corresponding ramp and structure for slidably interlocking with the T-section of said cutter tube contact means such that said cutter tube contact means is forced radially inwardly upon movement of said actuating arm in a first direction and is drawn outwardly upon movement of said actuating arm in

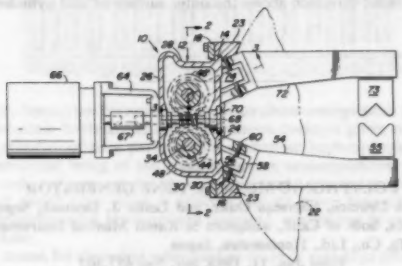
a second direction opposite the first direction, said actuating arms engaging said roller tube contact means comprising an inwardly facing pair of nonrotating steps with said tube contact means normally resting on said outer step and movable inwardly as said actuating arms are moved relative to said roller tube contact means such that said roller tube contact means rests on said inner step thereby moving said roller tube contact means radially inwardly in step fashion and into engagement with said tube prior to engagement of said tube by said cutter means.

4,467,683

SHEAR MECHANISM FOR GLASS FEEDER

Mark C. Newkirk, Vineland, N.J., assignor to Maul Technology Corporation, Millville, N.J.

Filed Jun. 14, 1982, Ser. No. 388,051
Int. Cl.³ B26D *5/08*
U.S. Cl. 83—54 **10 Claims**



1. A shear mechanism adapted to be attached to a feeder bowl for cutting a glass stream into gobs comprising a housing adapted to be attached to a feeder bowl, first and second shafts in said housing, a discrete arm connected to each shaft, at least one discrete blade connected to each arm, said blades being in overlapping relation in one position of said arms, a reversible electric motor supported by said housing, said motor having its output mechanically coupled by gears to said shafts for oscillating said shafts and arms in unison in opposite directions between open and closed positions by changing the direction of rotation of said motor.

4. A mechanism in accordance with claim 1 wherein said motor is a dc servo motor adapted for adjusting the angular opening of the arms and the speed of the arms on the fly.

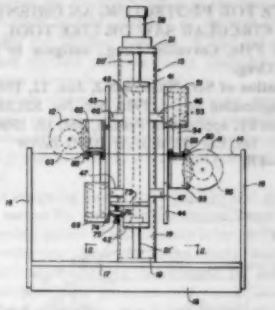
4,467,684

PRECISION POSITIONING SYSTEM FOR ROTARY POWER TOOLS

Roland H. Thorsell, Corvallis, Oreg., assignor to Excor, Inc., Corvallis, Oreg.

Filed Apr. 20, 1983, Ser. No. 486,729
Int. Cl.³ B27B *5/04*
U.S. Cl. 83—404.1 **11 Claims**

1. A system for positioning rotary cutting tools with precision on a primary support structure for such cutting tools, comprising a primary supporting base, a pedestal rising from the base, a cutter head vertical guideway supported by the pedestal adjacent to one side of the pedestal, a drum carriage means movably engaged with said guideway for movement upwardly or downwardly thereon, power means engaged with the drum carriage means to drive the latter upwardly or downwardly on said guideway, a cutter head carried by the drum carriage means including a pair of gear sectors mounted on opposite sides of the drum carriage means to travel vertically therewith upwardly or downwardly along said guideway, a pantograph linkage including a fixed arm attached to each gear sector and including movable arms, a rotary cutting tool drive motor on one movable arm of each pantograph linkage and a pantograph linkage drive motor including a drive pinion on said one movable arm of each Pantograph linkage with said pinion in mesh with the teeth of the adjacent gear sector, the improvement comprising means to universally adjust said pedestal on the supporting base horizontally, means to adjust at least the top of said drum carriage means universally horizontally relative to said pedestal, means to adjust one of said gear sectors horizontally on the drum carriage means, means to adjust the other gear sector vertically on the drum carriage means, and means to adjust each rotary cutting tool drive motor in a vertical plane universally on the movable pantograph linkage arm which carries such drive motor.

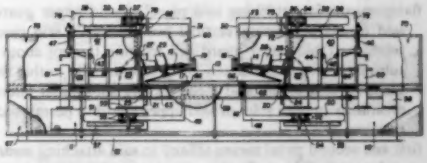


4,467,685

GUARD SYSTEM FOR TRUSS COMPONENT CUTTING APPARATUS

Roland H. Thorsell, Corvallis, Oreg., assignor to Excor, Inc., Corvallis, Oreg.

Filed Apr. 20, 1983, Ser. No. 486,912
Int. Cl.³ B27B *5/29*; B27G *19/02*
U.S. Cl. 83—478 **10 Claims**



1. In a guard system for a lumber component cutting machine of the class which includes a stationary support system and a movable support system for gangs of cutting saws through which lumber pieces are conveyed, and said support systems each having vertically and horizontally moving support means for a pair of upper synchronized lumber component conveyors and also having horizontally moving support means for lower lumber component conveyors, said guard system comprising a fixed horizontally elongated lower guard section adapted for securement to a base for the apparatus and being vertical and rising to an elevation near the tops of said lower conveyors, a pair of vertically movable guard sections spaced forwardly of the lower guard section and being vertically movable relative to the lower guard section and overlapping the top edge of the lower guard section in all operative positions, means attaching said pair of guard sections to the vertically moving support means of said support systems, and another pair of horizontally and vertically movable guard sections spaced rearwardly of the first-named pair and somewhat above the top edge of the lower guard section, said another pair of guard sections having overlapped relationship with the guard sections of the first-named pair in all operative

positions, and means attaching said another pair of guard sections to said horizontally moving support means.

4,467,686

DEVICE FOR PROTECTING AN ORIENTABLE CIRCULAR SAW OR LIKE TOOL

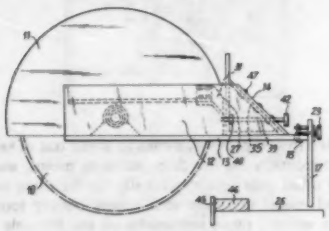
Stoddard H. Pyle, Corvallis, Oreg., assignor to Excor, Inc., Corvallis, Oreg.

Continuation of Ser. No. 224,062, Jan. 12, 1981,. This application Sep. 6, 1983, Ser. No. 528,868

Claims priority, application France, Jul. 18, 1980, 80 15916

Int. Cl.³ B27B *5/20*; B27G *19/04*

U.S. Cl. 83—478 **9 Claims**



1. In an orientable circular saw or like tool having a rotatable blade and an upper guard comprising a sheath element enveloping the upper part of the blade, a device for guarding the exposed lower portion of said blade comprising:

a piece of rigid transparent material laterally and frontally blocking the exposed lower portion of said blade directed towards a sawyer, said piece of transparent material having a front wall and two opposed side walls, each of which is inclined from the outside toward said blade from bottom to top,

fixing means for attaching said piece on said upper guard, said means permitting vertical positioning of said piece relative to said upper guard and rotation thereof about a substantially horizontal axis lying substantially within the plane of said blade, said piece having substantial lateral clearance on both sides of said upper guard to permit such rotation, and

first and second panel means affixed to said attaching means and extending laterally along opposite sides of said upper guard to fill said clearance.

4,467,687

ALIGNMENT SYSTEM FOR A ROTARY CUTTER

Robert F. Fokos, Wayland, and Dale E. Alden, Chelmsford, both of Mass., assignors to Special Products Engineering Corporation, Needham, Mass.

Filed Dec. 29, 1981, Ser. No. 335,507

Int. Cl.³ B27G *23/00*; B26D *1/62*

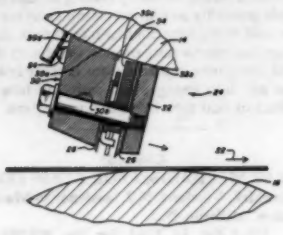
U.S. Cl. 83—674 **7 Claims**

1. Means for adjustably locating at least one knife blade assembly on the outer surface of a cylinder comprising,

at least two circumferential grooves formed in said cylinder,

at least two locating members located in each of said grooves, said locating members having at least one registration surface,

at least two half rings structured to nest in each of said grooves, said rings each having a surface that abuts the registration surface of said at least one locating member, said rings being dimensioned so that lateral movement is restrained by said grooves and circumferential movement is restrained by said locating members, and



at least one pin mounted on said rings and projecting in a radial direction above the outer surface of said cylinder.

4,467,688

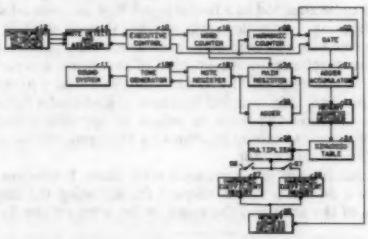
POLYPHONIC MUSICAL TONE GENERATOR

Ralph Deutsch, Sherman Oaks, and Leslie J. Deutsch, Sepulveda, both of Calif., assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jan. 11, 1983, Ser. No. 457,302

Int. Cl.³ G10H *7/00*

U.S. Cl. 84—1.01 **20 Claims**



9. In a keyboard musical instrument having a keyboard array of keyswitches, in which points defining the waveform of a musical tone are stored in a waveshape memory and are read out sequentially and converted into musical waveshapes, apparatus for producing a plurality of musical tones at frequencies corresponding to actuated keyswitches comprising;

a waveshape memory means for storing a set of data words defining the waveform of a musical tone,

a frequency number means for generating a frequency number in response to a detect signal,

a keyswitch state detect means wherein said detect signal is generated in response to each actuated keyswitch in said keyboard array of keyswitches,

a first addressing means for sequentially reading out data words stored in said waveshape memory means at a constant rate,

a selection gate means responsive to each said generated frequency number whereby data words read out from said waveshape memory means are selected, and

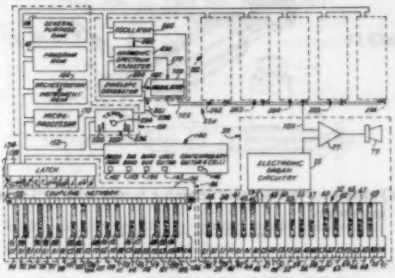
a means for producing musical waveshapes from data words selected by said selection gate means thereby generating said plurality of musical tones.

4,467,689

CHORD RECOGNITION TECHNIQUE

Glenn R. Stier, Vernon Hills, and Mark J. Fimoff, Hoffman Estates, both of Ill., assignors to Norlin Industries, Inc., White Plains, N.Y.

Filed Jun. 22, 1982, Ser. No. 391,019
Int. Cl.³ G10F 1/00
U.S. Cl. 84—1.03 8 Claims



1. Apparatus for reducing spurious chord recognitions in an electronic keyboard musical instrument during a given one of a plurality of time periods, said electronic keyboard musical instrument being of the type having an accompaniment keyboard, and a means for identifying a predetermined root note and chord type when a selected one or more keys of said accompaniment keyboard are operated, comprising in combination:

means for detecting when one or more of said keys defining a valid chord have been operated;

means for storing a first number equal to the number of said keys which are operated when a valid chord is detected by said detecting means;

means for storing a second number equal to the number of said keys which were operated during the time period preceeding said given time period;

means for determining if the number of said keys operated during said given time period are equal to or greater than the stored first number or the stored second number; and

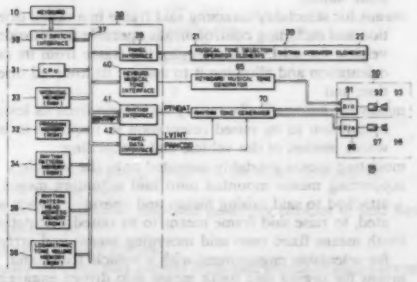
means operative in response to said determining means for controlling the sounding of a new root note and/or chord type by said instrument.

4,467,690

AUTOMATIC RHYTHM PERFORMANCE DEVICE

Tetsuo Nishimoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 15, 1983, Ser. No. 504,504
Claims priority, application Japan, Jun. 25, 1982, 57-108327
Int. Cl.³ G10H 1/42, 1/46
U.S. Cl. 84—1.03 7 Claims



1. An automatic rhythm performance device having a plurality of time-division multiplexed tone production channels, comprising:

rhythm selecting means for selecting a rhythm type of rhythm to be performed from among a plurality of thythm types;

rhythm pattern storing means for storing rhythm patterns representing the timings relating to rhythm tone production per each of said plurality of rhythm types and for outputting the rhythm patterns of said selected rhythm type, said rhythm patterns being assigned to said tone production channels, respectively;

group number storing means for storing group numbers identifying groups, respectively, said plurality of rhythm types being allocated to one of said groups and for outputting the group number to which said selected rhythm type belongs;

instrument assigning means connected to said group number storing means for assigning instrument name information representing names of instruments to be performed to said tone production channels, respectively, said instrument name inforamtion being determined by said outputted group number; and

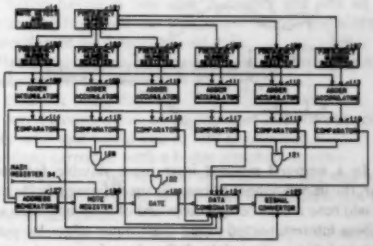
rhythm tone generating means connected to said rhythm pattern storing means and said instrument assigning means for generating rhythm tone signals corresponding to said assigned instrument name information on the corresponding tone production channels at the timing relating to the corresponding rhythm patterns, respectively.

4,467,691

SELECTABLE ENSEMBLE EFFECT IN AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed May 27, 1983, Ser. No. 499,047
Int. Cl.³ G10H 1/02
U.S. Cl. 84—1.24 18 Claims



1. In a keyboard musical instrument, having a keyboard array of keyswitches, in which a plurality of data words corresponding to the amplitudes of points defining the waveform of a musical tone are computed during a computation cycle and transferred sequentially to a digital-to-analog converter to be converted into musical waveshapes, apparatus for producing a plurality of musical tones each having ensemble effect in response to an actuated keyswitch comprising;

a coefficient memory means for storing a set of harmonic coefficients,

a first addressing means for reading out said set of harmonic coefficients from said coefficient memory means,

a waveshape memory means,

a means for computing responsive to said read out set of harmonic coefficients whereby during said computation cycle said plurality of data words corresponding to said amplitude of points defining the waveform of a musical tone are computed and stored in said waveshape memory means,

a keyswitch state detect means wherein a detect signal is

generated in response to each actuated keyswitch in said keyboard array of keyswitches,

a frequency number means for generating a plurality of frequency numbers in response to each said detect signal,

a number of frequency accumulator means each of which corresponds to an actuated keyswitch and each of which comprises a plurality of component accumulator means,

a plurality of adder means whereby each of said plurality of frequency numbers is successively added to the contents of an associated one of said component accumulator means to form a plurality of accumulated frequency numbers corresponding to each said detect signal,

a second addressing means for sequentially reading out data words stored in said waveshape memory means,

a selection gate means responsive to said accumulated frequency numbers whereby data words read out from said waveshape memory means are selected,

a data combination means whereby a plurality of data words corresponding to each plurality of accumulator means associated with each said actuated keyswitch are combined to form a combination waveshape data point, and

a means for producing musical waveshapes responsive to each said combination data point whereby musical tones are produced having said ensemble effect.

4,467,692

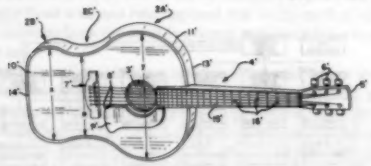
STRINGED MUSICAL INSTRUMENT WITH IMPROVED BASE AND SOUND BOX

William H. Egan, 3234 Ellington Dr., Los Angeles, Calif. 90068

Filed Dec. 27, 1982, Ser. No. 453,351

Int. Cl.³ G10D *3/02*

U.S. Cl. 84—291 **14 Claims**



1. In a stringed musical instrument suitable for use as a guitar, the improvement of base means defining a hollow sound box, said base means being comprised of front and back surface members interconnected along their outer edges by side wall means and being shaped to define base inner and outer end portions of predetermined different widths interconnected by a narrowing base middle portion, said base outer end portion having a smaller width than said guitar base inner end portion whereby said guitar base means adapts to the shape of a person's body so as to facilitate the holding and playing of same.

4,467,693

HOLDER FOR GUITAR PLECTRA

Jack W. Nasfell, Jr., Scottsdale, Ariz., assignor to The Wright Co. Inc., Phoenix, Ariz.

Filed Sep. 30, 1982, Ser. No. 428,734

Int. Cl.³ G10G *7/00*

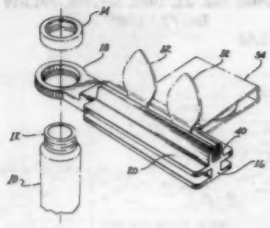
U.S. Cl. 84—329 **9 Claims**

1. A microphone stand mountable holder for plectra, said holder comprising in combination:

(a) means for securing said holder to a microphone stand;

(b) means extending from said securing means for supporting the plectra, said supporting means including means for storing packs of plectra;

(c) means for removably retaining said plectra; and



(d) means for mating said retaining means with said supporting means.

4,467,694

MINE FIELD CLEARING APPARATUS

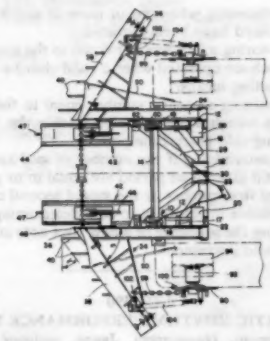
Max Azulai, Beersheva; Simcha Bar-Nefy, Omer, and Michael Tiomkin, Beersheva, all of Israel, assignors to Israel Aircraft Industries, Ltd., Lod, Israel

Filed May 28, 1982, Ser. No. 383,214

Claims priority, application Israel, Jul. 27, 1981, 63437

Int. Cl.³ F41H *11/2*

U.S. Cl. 89—1 M **6 Claims**



1. Mine clearing apparatus for attachment to a vehicle including a vehicle tread and comprising:

a frame mountable onto a vehicle for selectable positioning in a raised or lowered orientation;

means, mounted onto said frame, for raising and shunting aside mines;

means for selectably retaining said frame in a raised orientation and including control means operable from inside the vehicle for selectably releasing the frame from its raised orientation and allowing it to assume its lowered orientation; and

means for automatically raising said frame from its lowered orientation to its raised orientation in response to backwards motion of the vehicle and comprising:

mounting means rotatably mounted onto the vehicle;

supporting means mounted onto said mounting means and attached to said raising means and operative, when actuated, to raise said frame means to its raised orientation;

tooth means fixed onto said mounting means and arranged for selectable engagement with a vehicle tread; and

means for urging said tooth means into driven engagement with said vehicle tread whereby during backwards movement of said vehicle, the vehicle tread causes the mount-

ing means to rotate, thereby actuating said supporting means, thereby raising said frame to its raised orientation.

4,467,695

SAFE JETTISON DEVICE FOR AIRCRAFT STORES

Robert L. Bonde, St. Louis Park, Minn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1983, Ser. No. 489,920
Int. Cl.³ F41F 5/02
U.S. Cl. 89—1.5 D 11 Claims

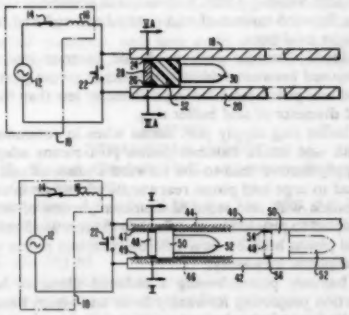
1. A safe jettison device for aircraft stores comprising:
an arming line to trigger the store;
an arming line conduit, which is slotted to hold said arming line, mounted near said store;
a coil which fits into said conduit for removal of said arming line such that said arming line passes through said coil;
a strap around said coil for pulling said coil until it skews and extracts said arming line from said conduit;
a mounting connected to said strap; and
an activation device connected to said mounting for holding said mounting with a first preset force prior to activation and a second different preset force after activation.

4,467,696

ELECTROMAGNETIC PROJECTILE LAUNCHER WITH COMBINATION PLASMA/CONDUCTOR ARMATURE

Ian R. McNab, Murrysville, and George A. Kemeny, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1982, Ser. No. 381,602
Int. Cl.³ F41F 1/00
U.S. Cl. 89—8 26 Claims



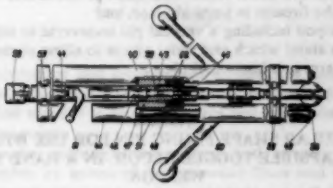
1. An electromagnetic projectile launcher comprising:
a first conductor;
a second conductor disposed generally parallel to said first conductor;
a source of high current;
means for switching current from said source of high current to said first and second conductors;
a conductive element disposed between said conductors for conducting current therebetween and for propelling a projectile along said conductors;
said conductive element having a length less the distance between said conductors, such that metallic contact between said conductive element and said conductors is prohibited at all times;
a first plasma for conducting current between said first conductor and said conductive element; and
a second plasma for conducting current between said second conductor and said conductive element.

4,467,697

ANTI-RECOIL ARRANGEMENT

Leonard Witt, and Mary L. Witt, both of 1923 N. Howe St., 2R, Chicago, Ill. 60614

Continuation-in-part of Ser. No. 065,113, Aug. 9, 1979, abandoned. This application Apr. 5, 1982, Ser. No. 365,380
Int. Cl.³ F41F 19/00
U.S. Cl. 89—37 GM 1 Claim



1. A firearm comprising:
a wooden stock,
a receiver mounted in said stock,
a bolt mounted in said receiver for longitudinal movement,
a barrel mounted on said receiver to extend forwardly thereof,
said barrel having a rear end, a muzzle end and an axis extending from said rear end to said muzzle end along the direction of movement of said bolt,
said barrel having a chamber at its rear end near where it is mounted on said receiver,
said chamber being coaxial with said barrel axis,
said barrel having a bore extending from said chamber coaxially with said barrel axis to said muzzle end,
an unfired cartridge with a bullet attached thereto,
said unfired cartridge being in said chamber and said bullet attached thereto being in said bore defining the rest position of said bullet,
two cylinders placed on said barrel near said rest position of said bullet,
said two cylinders each having an axis parallel to said barrel axis,
passages connecting said bore of said barrel to said cylinders to conduct gas generated upon discharge of said unfired cartridge to each of said two cylinders,
a movable housing having rearward and forward ends and mounted coaxially with said barrel and slidable along said barrel,
two pistons,
means attaching said two pistons to said housing near the rearward end thereof to be coaxial with said two cylinders,
a first spring biasing said housing such that said two pistons are biased toward said rest position,
whereby, discharge of said unfired cartridge produces gas which propels said bullet through said bore beyond said muzzle causing recoil and a portion of such gas is conducted through said passages to said two cylinders to force said two pistons and said movable housing attached thereto towards the rear,

said movable housing sliding rearwardly along the barrel to counter the recoil,

bumpers near the rear end of said barrel and the rearward end of said housing to stop rearward sliding of said housing along said barrel after discharge of said unfired cartridge and after said bullet leaves said muzzle of said barrel,

a muzzle-brake threaded on the forward end of said housing to counter the recoil,

a connecting ear attached to said housing between said forward and rearward ends,

a tripod connected to said connecting ear,

said tripod including a slider connected to said connecting ear and movable along an axis parallel to said barrel axis from forward position to a rearward position in response to recoil produced by discharge of said unfired cartridge,

said tripod including second spring means biasing said slider toward its forward position,

said tripod including screws to adjust the forward position of said slider,

said tripod including a horizontal pin transverse to said barrel axis about which said slider pivots to allow aiming of the firearm in vertical plane, and

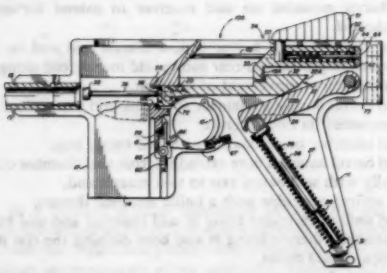
said tripod including a vertical pin transverse to said barrel axis about which said slider pivots to allow aiming of the firearm in a horizontal plane.

4,467,698

ANGULAR SHAPE FIRING PIN FOR USE WITH A COLLAPSIBLE TOGGLE RECOIL IN A HAND HELD WEAPON

Walter E. Perrine, 15050 Burbank Blvd., Apt. No. 17, Van Nuys, Calif. 91411

Filed Nov. 16, 1981, Ser. No. 321,736
Int. Cl.³ F41C *5/00*
U.S. Cl. 89—190 **5 Claims**



1. A bolt action weapon comprising:

a frame,

a handle on said frame,

a trigger mounted on said frame adjacent said handle,

a hollow barrel having a firing chamber,

a bolt movable in said frame axially to and from the firing chamber of said barrel,

said bolt being provided with a surface at one end thereof which is angular to the longitudinal axis of said bolt forming a first cam surface,

an elongated link connected at one end to said frame and providing a second cam surface along its length for engagement with said first cam surface,

said first cam surface of said bolt and said second cam surface of said link being relatively slidably movable one over the other until said second cam surface engages a particular area on said first cam surface to retain said bolt when it has been moved to said firing chamber,

a compression means mounted in said handle for biasing said link into contact with said bolt and for controlling the movement of said link as it collapses by causing its free end to swing downwardly away from said bolt into said handle, and

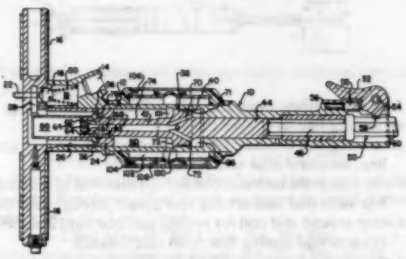
a trip ejector arm pivotally mounted on said frame adjacent said trigger for restraining the bolt from moving to said firing chamber until actuated for pivotal movement by said trigger.

4,467,699

PNEUMATIC MOTOR

Louis H. LeBlanc, Claremont, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Nov. 4, 1981, Ser. No. 318,128
Int. Cl.³ F01B *7/18*; F01L *21/02*
U.S. Cl. 91—25 **8 Claims**



1. A pneumatic motor comprising

a hammer piston having a piston head and a rearwardly projecting piston stem,

a cylinder within which said hammer piston is positioned for relative reciprocating movement,

a buffer ring fixedly secured within a rear portion of said cylinder receiving a portion of said hammer piston stem,

inlet port means in communication with said buffer ring for supplying pressurized motive fluid thereto,

supply port means formed within said buffer ring for delivering said motive fluid to said hammer piston,

intake hammer piston port means in communication with the outer peripheral surface of said hammer piston stem for intermittent communication with said supply port means,

said hammer piston having an axial bore in communication with said intake hammer piston port means,

discharge hammer piston port means in communication with the forward surface of said piston head and said hammer piston axial bore,

a reduced diameter portion of said hammer piston stem disposed between said intake hammer piston port means and said piston head having a diameter less than the internal diameter of said buffer ring,

said buffer ring supply port means when in communication with said intake hammer piston port means adapted to supply motive fluid to the forward surface of said piston head to urge said piston rearwardly and when in communication with said reduced diameter portion of said stem adapted to provide motive fluid to the rearward surface of said piston head by flow externally of said piston to urge said piston forwardly,

said hammer piston having a reduced diameter hammer portion projecting forwardly from said piston head,

said discharge hammer piston port means having a number of passageways diverging from said axial bore to said piston head forward face,

said intake hammer piston port means having a number of passageways oriented generally radially between the periphery of said piston stem and said axial bore,

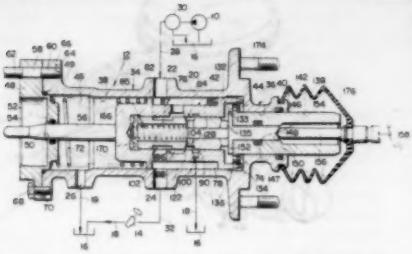
said piston stem having a generally rearwardly disposed free end, and said axial bore terminating short of the free end of said hammer piston stem, and

reduced diameter bore means connecting said axial bore with the free end of said piston stem.

4,467,700
HYDRAULIC BOOST MECHANISM

Jun Udono, Higashiyamato, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 109,483, Jan. 4, 1980,. This application Oct. 29, 1981, Ser. No. 316,139
Claims priority, application Japan, Jan. 17, 1979, 54-4098
Int. Cl.³ F15B 9/10
U.S. Cl. 91—378 13 Claims



1. A hydraulic power boost mechanism in a hydraulic brake system for an automotive vehicle, said system including a brake pedal, said mechanism comprising:

a housing formed with an inlet port, an outlet port and an exhaust port therein, said housing having a housing bore formed therein, said housing bore including first and second sections, said first and second sections having different diameters with respect to each other;

a power piston slidably disposed within said first section of said housing bore to define a pressure chamber and an exhaust chamber in said first section, said power piston having a longitudinally extending piston bore formed therein;

a control valve disposed within said piston bore and being movable along the longitudinal axis of said piston between an applied position and a released position; and

an actuation means for operating said control valve in response to the position of said brake pedal, said actuation means including an inner and outer member, said outer member being slidably received within said second section of said housing bore and engaging said power piston, said inner member having a head abutting said control valve for moving said control valve between said released and applied positions, and said inner member being freely movable with respect to said outer member in response to movement of said brake pedal.

4,467,701
EXPANSIBLE DEVICE

James W. Sigmon, Charlotte, N.C., assignor to Sigmon Company, Charlotte, N.C.

Continuation of Ser. No. 6,892, Jan. 26, 1979, Pat. No. 4,295,633. This application Jul. 13, 1981, Ser. No. 282,742
Int. Cl.³ F16J 3/02, 15/46
U.S. Cl. 92—103 M 16 Claims

1. A fluid control device, comprising:

a relatively immovable annular first member;

a relatively movable annular second member at least partly concentrically located within said first member and spaced from said first member to form a chamber;

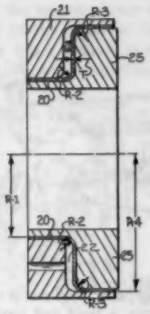
an external fluid pressure source in fluid communication with said chamber;

an annular sealer disposed in said chamber between said first and second members, fluid-tightly sealing said chamber, said sealer comprising:

a first section extending substantially parallel to the longitudinal axis of said first member;

a second section extending substantially parallel to the longitudinal axis of said first member, located at a different radial distance from the longitudinal axis of the first member than said first section and substantially axially spaced from said first section;

an intermediate section connecting said first and second sections, contoured to the shape of and at all times fully



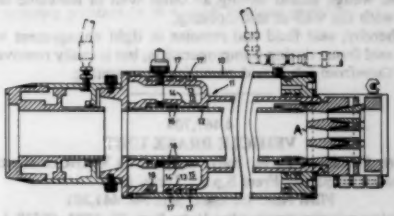
contacting said second member, said first and second sections being attached at their respective ends to said first member to form respective first and second terminal points,

said sealer exerting pressure upon said movable second member by means of fluid pressure from said pressure source.

4,467,702
HYDRAULIC JACKS

Peter E. Ellen, Hong Kong & Macau Bldg., 156-7 Connaught Rd., C., Hong Kong, Hong Kong

Filed Dec. 22, 1981, Ser. No. 333,389
Claims priority, application Australia, Dec. 24, 1980, PE7065
Int. Cl.³ F01B 31/06
U.S. Cl. 92—108 6 Claims



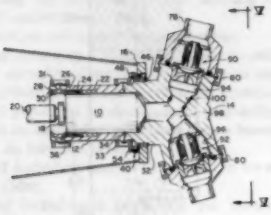
2. A hydraulic jack comprising a cylinder and a piston movable therein, the piston having in its head a cavity, said cavity being bounded by the inner surface of a peripheral wall of the piston, the outer surface of which is in close proximity to the inner surface of the cylinder, sealing means being provided between the piston and cylinder to seal the clearance between the same, the cylinder and the piston wall being so deformable and having such dimensions that the hydraulic pressure applied within the cylinder deforms the cylinder wall and the piston wall in such a manner that, over the normal range of operating pressures of the jack the clearance between the piston and the cylinder remains within the capacity of the sealing means to provide a seal between them.

4,467,703

RECIPROCABLE PUMP

Fletcher H. Redwine, Garland, and James E. Thompson, Richardson, both of Tex., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1982, Ser. No. 411,932
Int. Cl.³ F04B 39/14
U.S. Cl. 92—128 13 Claims



1. In a single-acting pump, said pump including a reciprocable displacement body, a fluid end having a first elongated passage for receiving said body axially and slidably therein and suction and discharge passages communicating with said first passage, a power frame for absorbing forces exerted on said fluid end due to reciprocation of said body, and means for connecting said fluid end to the power frame,

the improvement in said pump which comprises:

said fluid end having a barrel portion and a main portion,

said barrel portion having said first passage extending longitudinally therein and at least partially therethrough,

said frame having an opening for receiving the barrel portion longitudinally therein,

said opening being tapered from a larger to smaller cross-section in the direction of inward strokes of said body into said fluid end,

the wall of said opening making an angle with respect to the axis of said opening within the range of 5 to 25 degrees, and

said means for connecting the fluid end to said power frame, including wedge means extending circumferentially around the outer periphery of said barrel portion in the transverse direction thereof, and being separable therefrom,

said wedge means having an outer wall of mateable taper with the wall of said opening,

whereby, said fluid end remains in tight engagement with said frame during pump operation, but is easily removable therefrom when said pump is not operating.

4,467,704

VEHICLE BRAKE UNIT

Enrico Casalone, Turin, Italy, assignor to WABCO Westinghouse Compagnia Freni S.p.A., Turin, Italy

Filed Nov. 15, 1982, Ser. No. 441,351
Claims priority, application Italy, Nov. 26, 1981, 68539 A/81
Int. Cl.³ F16J 1/10
U.S. Cl. 92—129 12 Claims

1. A brake unit for a railway vehicle comprising:

(a) a housing;

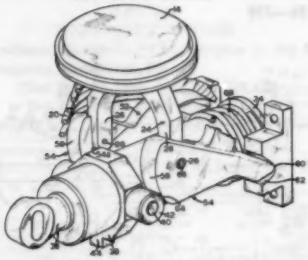
(b) a cylinder formed in said housing;

(c) a piston reciprocably disposed in said cylinder;

(d) a thrust rod arranged in said housing to move axially in a direction perpendicular to the direction of movement of said piston;

(e) actuator means for effecting said axial movement of said thrust rod in response to operation of said piston, said actuator means including a cam member comprising:

(i) a thrust portion having a cam surface engageable with a complementary thrust portion of said thrust rod, said cam surface having a curved profile provided by a first radius of curvature forming a sharply inclined section engageable with said thrust portion of said thrust rod during initial operation of said piston in one direction and at least one different radius of curvature forming a less sharply inclined section engageable with said thrust portion of said thrust rod during operation of said piston in said one direction subsequent to said initial operation;



(ii) a connection with said piston; and

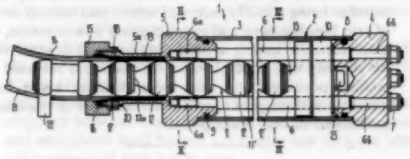
(iii) a reaction portion pivotally engageable with a complementary reaction portion of said housing to provide angular rotation of said cam member.

4,467,705

FLUID-ACTUATED DRIVE

Walter Reist, Hinwil, Switzerland, assignor to Feramatic AG, Hinwil, Switzerland

Filed Jan. 11, 1982, Ser. No. 338,569
Claims priority, application Switzerland, Feb. 10, 1981, 874/81
Int. Cl.³ F01B 9/00
U.S. Cl. 92—137 12 Claims



1. A fluid actuated drive, especially a traction and thrust drive comprising:

a piston-and-cylinder unit comprising a cylinder having opposite ends and a piston arranged for to-and-fro motion within said cylinder along a predetermined piston stroke;

means for closing said cylinder at both of said opposite ends;

a piston rod connected with the piston and serving to transmit predetermined forces;

said piston rod extending through one of the closed ends of said cylinder;

said piston rod being structured to be spatially movable over its entire length;

guide means extending in the direction of movement of said piston rod for guiding said piston rod over its entire length; and

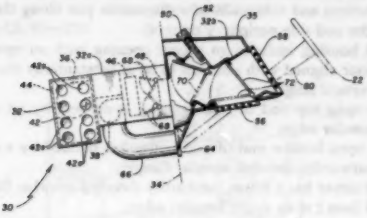
said guide means having a first portion arranged outside of said cylinder and a second portion arranged within said cylinder in guiding engagement with said piston rod and extending over the entire length of the piston stroke.

4,467,706

ENVIRONMENTAL CONTROL FOR TRACTOR CAB

Barry D. Batcheller, West Fargo, and William E. Martinson, Fargo, both of N. Dak., assignors to Steiger Tractor, Inc., Fargo, N. Dak.

Filed Mar. 8, 1982, Ser. No. 356,106
Int. Cl.³ B64D 13/00; B60H 1/00; F24F 7/00
U.S. Cl. 98—1.5 14 Claims



1. In an off-the-road land vehicle of the type having prime mover means for providing motive power and ground engaging means driven by the prime mover means, and having an enclosed cab in which a human operator resides when operating the vehicle, an environmental control system for the enclosed cab, the environmental control system comprising:

a plenum having fresh air intake means through which fresh air is drawn into the plenum, recirculation air intake means through which air is drawn from the cab into the plenum, and outlet means through which air is exhausted into the cab;

pressurization blower means between the fresh air intake means and the outlet means for causing air flow from the fresh air intake means to the outlet means;

first motor means for driving the pressurization blower means as a function of a first motor control signal;

recirculation blower means between the recirculation air intake means and the outlet means for causing air flow from the recirculation air intake means to the outlet means;

second motor means for driving the recirculation blower as a function of a second motor control signal;

speed select means for providing a speed select signal;

fresh air filter means for filtering air flowing from the fresh air intake means to the pressurization blower means;

pressurization blower speed sensor means for providing a speed sensor signal indicative of speed of the pressurization blower means, wherein the speed of the pressurization blower means varies as a function of air flow from the pressurization blower means; and

control means for producing the first and second control signals to drive independently the pressurization blower means and the recirculation blower means, the first motor control signal being a function of the speed sensor signal to maintain an essentially constant air flow from the pressurization blower means to the outlet means despite changes in cab pressure and condition of the fresh air filter means and the second control signal being a function of the speed select signal.

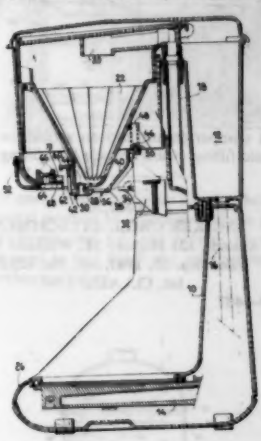
4,467,707

DOMESTIC COFFEE MAKER

Jacques H. J. Amiot, Alencon, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Filed Mar. 29, 1983, Ser. No. 480,140
Claims priority, application France, Apr. 9, 1982, 82 06256
Int. Cl.³ A47J 31/00
U.S. Cl. 99—279 6 Claims

1. Domestic coffee maker comprising a casing, a cold water reservoir housed in the casing, a water heater in the casing, first tube means connecting the reservoir and the water heater, a removable infusion container supported on the casing, a filter mounted above the infusion container, a spout mounted above the filter, second tube means connecting the water heater to the spout, and an outflow aperture at the bottom of the filter, wherein the coffee maker further comprises a closure valve for the outflow aperture and an opening lever movable relative to the casing for controlling the closure valve, the opening lever being arranged such that movement of the infusion container causes displacement of the opening lever and hence of the closure valve, removal of the container being arranged to move the opening lever into a position in which the closure valve completely closes the outflow aperture, and wherein the



closure valve has an arm pivotally mounted by a pivot axis on the casing, a first part of the arm situated on one side of the axis being arranged to engage the opening lever, a second, operative part of the arm situated on the other side of the axis carrying a stopper for closing the outflow aperture, and further comprising a manual lever mounted for movement relative to the casing and arranged to control movement of the second operative part of the arm, the manual lever being movable between first and second positions, in which, on operation of the opening lever, the stopper is held respectively either in a large opening position or in a small opening position.

4,467,708

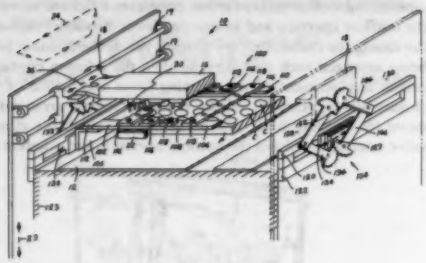
STRIPPER FOR FILLING MACHINE

Richard L. Twiford, Englishtown, and John W. Hood, East Brunswick, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,728
Int. Cl.³ A21C 3/04, 9/06; A21D 8/02
U.S. Cl. 99—450.8 20 Claims

1. In a filling machine having filling means including a filling needle and drive means for propelling said filling means in a direction generally parallel to conveyor means for moving an article through said machine and for injecting and retracting said filling needle into and out of an article on said conveyor means, a stripping apparatus, said stripping apparatus comprising stripper means for contacting and stripping an article on said conveyor means from said filling needle and synchronizing means for linking said stripper means to said filling means

to move said stripper means with an article on said conveyor means while substantially preventing lateral movement be-



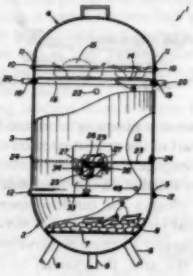
tween said stripper means and an article on said conveyor means as said filling means retracts said filling needle.

4,467,709

SMOKER GRILL ATTACHMENT

Charles T. Anstedt, 131 Hickory St., Williams Bay, Wis. 53191

Filed Sep. 30, 1982, Ser. No. 429,019
Int. Cl.³ A23B *4/04*
U.S. Cl. 99—482 **1 Claim**



1. An apparatus for converting a kettle-type food cooker having a fuel-holding base and a cover for enclosing the base into a food smoker, comprising:

an upright cylindrical housing having an open top and bottom, said housing positionable between the fuel-holding base and cover so that the base, housing and cover may be orientated in a vertically stacked arrangement to define a smoking chamber;

grill support means at the upper end of said housing for removably supporting a grill in said smoking chamber; and

pan support means including a brace member extending across the lower end of said housing and engaging the bottom of a liquid steaming pan to removably support said pan in said smoking chamber;

and wherein: said grill support means includes a pair of distally opposite inwardly extending tabs mounted on the inner surface of said housing, and an elongate cross bar brace member extending across the interior of said housing substantially coplanar with and crossecting a line between said tabs and having distal ends mounted to distally opposing side walls of said housing, said cross bar brace member engaging the underside of said grill along a sectional line therethrough to support said grill centrally in addition to support along peripheral edges of said grill provided by said tabs and said distal ends of said cross bar brace member;

said pan support means includes a second cross bar brace member extending across the interior of said housing and having distal ends mounted to distally opposing side walls of said housing, and a bracket member secured to said second cross bar brace member and extending thereacross, said second cross bar brace member and said bracket member including a plurality of spaced generally vertical abutment surfaces defining a peripheral boundary with sides formed by said vertical abutment surfaces and a bottom formed by said second cross bar brace member and said bracket member for supporting and retaining bottom and side walls of a disposable pan along the bottom and side periphery thereof;

said housing includes an access opening with an openable door aligned with said pan to be at substantially the same vertical height;

the open top end of said housing is defined by an upper annular edge;

the open bottom end of said housing is defined by a lower outwardly directed annular flange;

said cover has a lower outwardly directed annular flange;

said base has an upper annular edge;

said upper edge of said housing has an outer diameter substantially the same as and mating with the inner diameter of said lower outwardly directed annular flange of said cover, such that said flange of said cover freely rests on said upper annular edge of said housing in overlapping relation to provide a substantially air tight seal therewith; and

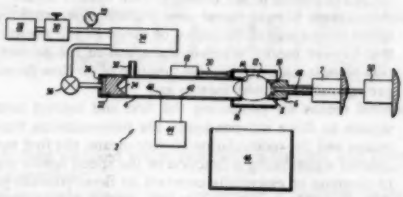
said lower flange of said housing has an inner diameter substantially the same as and mating with the outer diameter of said upper annular edge of said base, such that said flange of said housing freely rests on said upper annular edge of said base in overlapping relation to provide a substantially air tight seal therewith.

4,467,710

APPARATUS FOR CRACKING EDIBLE NUTS

Brahm P. Verma, and Stanley E. Prussia, both of Griffin, Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Dec. 14, 1981, Ser. No. 330,663
Int. Cl.³ A23N *5/00*
U.S. Cl. 99—571 **11 Claims**



1. A nut cracker comprising:

a hollow barrel having two ends and a longitudinal axis;

nut holder means coaxial with said barrel and spaced from one open end of said barrel;

means for providing relative movement between said barrel and said nut holder means whereby a nut may be clamped between said nut holder means and said one end of said barrel;

a lightweight freely moving billet movable within said barrel along the axis thereof and normally positioned at the other end of said barrel;

means for accelerating said billet towards said one end of said barrel at high velocity, said means for accelerating permitting said billet to travel freely such that said billet is free of external forces acting in the direction towards said one end of said barrel when said billet reaches said one end

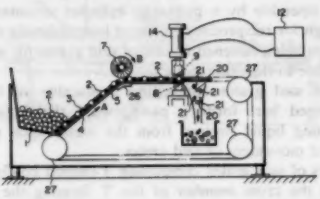
of said barrel, whereby substantially only kinetic energy of said billet is used to crack said nut.

4,467,711

METHOD AND APPARATUS FOR CRACKING NUTS

Hisayoshi Oiso, Tokyo, and Norio Joyama, Kanagawa, both of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,352
Claims priority, application Japan, May 15, 1981, 56-72162
Int. Cl.³ A23N *5/00*
U.S. Cl. 99—577 2 Claims



1. A nut cracking apparatus comprising a lower nut gripping means and an upper nut gripping means disposed in vertical alignment with each other and moveable toward and away from said nut for gripping and releasing said nut, a lower fixed blade means and an upper moveable blade means being disposed in vertical alignment with each other and moveable relative to each other through said gripping means for cutting the shell of the nut on opposite sides thereof, actuating means for moving said upper gripping means and said upper blade means in opposite directions relative to the lower gripping means and lower fixed blade means and conveying means for automatically positioning a nut between said gripping means and removing the nut subsequent to cracking, said lower nut gripping means being comprised of a first block having a nut receiving recess in one surface thereof with a slot in said recess for allowing penetration of said lower fixed blade means into said recess, spring means normally biasing said first block relative to said lower fixed blade means so that said lower fixed blade means will not extend into said recess, said upper blade means being connected to said actuating means and said upper gripping means comprising a second block having a nut receiving recess therein with a slot in the recess for permitting penetration of said upper blade means into said recess, spring means normally biasing said second block relative to said upper blade means so that said upper blade means will not extend into said recess, means for operating said actuating means for gripping a nut between said first and second blocks and causing penetration of said upper and lower blade means into said recesses to cut said shell of said nut into two pieces.

4,467,712

WOOD BALER

James R. Fincham, Rte. 3, Box 75B, Leon, Iowa 50144

Filed Jun. 1, 1982, Ser. No. 383,997
Int. Cl.³ B65B *13/20*
U.S. Cl. 100—8 10 Claims

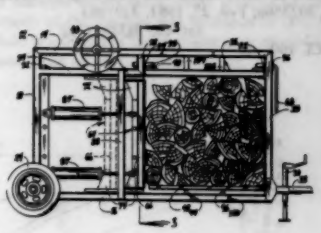
1. A wood baling device comprising:

an elongated rectangular frame having a top frame member, a bottom frame member, and first and second opposite end frame members, said top frame member comprising a fixed part and a movable part;

an elongated vertically disposed pressure member having upper and lower ends;

bearing means movably connecting said upper end of said pressure member to said fixed part of said top frame member and movably connecting said lower end of said pressure member to said bottom frame member for longitudinal movement of said pressure member with respect to said fixed part of said top frame member and said bottom frame member; whereby said pressure member is movable from a first position located a first distance from said second end frame member to a second position located a second distance from said second end frame member, said second distance being less than said first distance;

extensible power means between said first end member and said pressure member for moving said pressure member between said first and second positions;



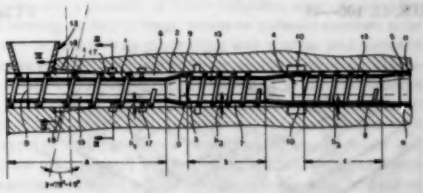
said movable part of said top frame member being movable from an initial position to a pressure release position, the distance between said top and bottom frame members being increased as said top frame member moves to said pressure release position.

4,467,713

METHOD OF RECOVERING OIL FROM OIL-BEARING VEGETABLE MATTER

Manfred Knuth, and Thorsten Homann, both of Hamburg, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Division of Ser. No. 139,338, Apr. 11, 1980, Pat. No. 4,357,865.
This application Apr. 1, 1982, Ser. No. 364,406
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1982, 2915538
Int. Cl.³ B30B *13/00*
U.S. Cl. 100—37 2 Claims



1. A process for recovering oil from oil-bearing vegetable matter which comprises the steps of:

(a) cleaning said vegetable matter;

(b) directly upon cleaning of said vegetable matter and without intervening mechanical or thermal conditioning, subjecting the cleaned vegetable matter to cold pressing of oil therefrom, thereby forming a residue; and

(c) solvent extracting said residue and recovering oil from the solvent thus used.

4,467,714
APPARATUS FOR COMPACTING TRASH IN OPEN CONTAINERS

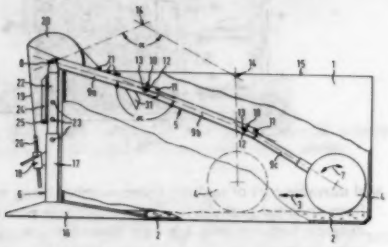
Heinz Bergmann, Im Ründerdiek 1, D4474 Lathen, Fed. Rep. of Germany

Division of Ser. No. 274,782, Jun. 18, 1981, Pat. No. 4,426,925. This application Sep. 30, 1983, Ser. No. 537,520

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023508; Feb. 27, 1981, 3107383

Int. Cl.³ B30B *3/02*

U.S. Cl. 100—43 **28 Claims**



1. Apparatus having a base for compacting trash, in particular cardboard cartons or the like, in an upwardly open container positioned on said base, said container having an upper edge, comprising:

(a) a post (**6**) mounted on said base;

(b) a pivot arm (**5**) having a free end mounted in articulating manner to said post above said upper edge;

(c) a compacting roll (**4**) having a roughened surface rotatably supported from said free end;

(d) means for moving said compacting roll to-and-fro on said trash in said container; and

(e) said pivot arm (**5**) provided with at least one hinge joint (**10**) dividing said pivot arm (**5**), a stop means (**11**) being provided in the area of said hinge joint (**10**) to prevent the complete straightening of said pivot arm (**5**) so that any two sections (**9a**, **9b**, **9c**) joining said hinge joint (**10**) subtend an angle (alpha) less than 180° when said roll (**4**) is in the wholly extended position.

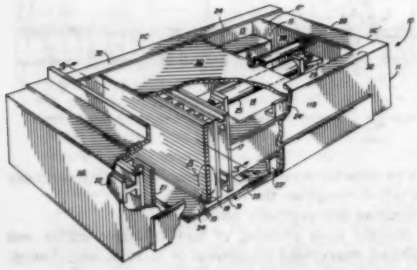
4,467,715
MOISTURE REDUCING RAM PRESS

Richard E. Bunger, 5202 E. Washington St., Phoenix, Ariz. 85034

Filed Feb. 28, 1983, Ser. No. 470,769

Int. Cl.³ B30B *9/04*

U.S. Cl. 100—45 **3 Claims**



1. A press for extracting liquid from waste material comprising:

a frame forming a trough opened at one end to form a waste receiving inlet port and a compressed waste discharging outlet port,

a pair of movable gates, one of which opens and closes each of the inlet and outlet ports in a predetermined sequence,

means for moving said gates to open and closed positions,

said means for moving each of said gates comprising a hydraulic cylinder mounted within said trough,

a pair of spacedly-arranged grates mounted within said trough at said one end to define therebetween a waste receiving and waste compressing chamber,

the inlet and outlet ports opening into and out of said chamber,

a ram operable by a hydraulic cylinder mounted in said trough for reciprocal movement longitudinally thereof,

said ram being fastened to one of said grates for moving it relative to the other grate,

each of said grates comprising a plurality of spacedly-arranged bars forming passageways therebetween for draining liquid pressed from the waste upon predetermined movement of said grates,

the bars of said grates comprising T-shaped configurations with the cross member of the T forming the pressing surface of the grate, and

the openings between the spacedly arranged bars of said grates being wider downstream of the grate surface than at the grate surface,

drain openings in said frame adjacent each of said grates for removing from said frame the liquid pressed out of the waste, and

means for moving said ram to cause relative movement of said grates to provide a controlled pressing operation on the waste.

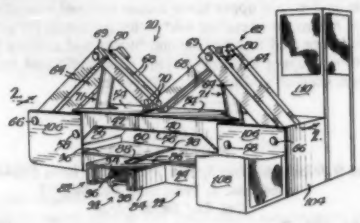
4,467,716
VEHICLE COMPACTOR

Richard E. Woods, P.O. Box 18, and Marvin D. Bradburn, P.O. Box 11, both of Markle, Ind. 46770

Division of Ser. No. 347,489, Feb. 10, 1982, Pat. No. 4,426,928. This application Sep. 22, 1983, Ser. No. 534,807

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—45 **14 Claims**



1. An automatic control system for a vehicle compactor having at least one door operable to compact a vehicle fed into the compactor, comprising:

means for closing said door to compact only a portion of the vehicle;

opening means actuable in response to the completion of compaction for opening said door;

advancing means actuable in response to the termination of the opening of said door for advancing the vehicle a distance through said compactor; and

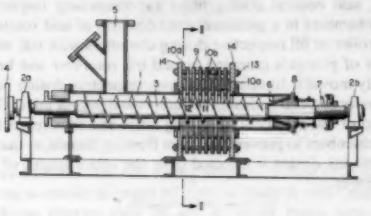
cycle means for repeating actuation of the closing means to automatically compact additional portions of the vehicle.

4,467,717

SCREW PRESS DEHYDRATOR PROVIDED WITH CAKE CUTTER

Toshiyoshi Yamamoto, Nobeoka, Japan, assignor to Sanshukakan Kogyo Kabushiki Kaisha, Nobeoka, Japan

Filed Oct. 25, 1982, Ser. No. 436,358
Claims priority, application Japan, Oct. 30, 1981, 56-174801
Int. Cl.³ B30B 9/12
U.S. Cl. 100—117 5 Claims



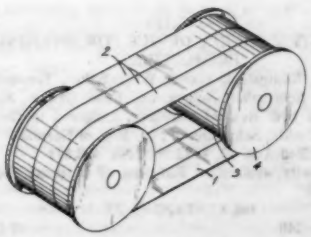
1. A screw press dehydrator with a cake cutter comprising:
a rotatable screw;
a screw barrel having said rotatable screw therein, said screw barrel having a discharge outlet at one end thereof; and
a plurality of stationary and sliding plates alternately disposed around said screw barrel at a position closer to said discharge outlet, wherein said stationary and sliding plates each possess a circular hole through which said screw barrel extends, the circular holes in said sliding plates have a larger radius than the circular holes in the stationary plate, the stationary plates and the sliding plates are disposed to permit the centers of the stationary plates and the sliding plates to deviate from each other so that the circumference of the circular holes in the stationary plates always contact one point of the circular holes in the sliding plates, and said sliding plates are rotatable so that the center of the circular holes in the sliding plates define a circle having a radius whose length corresponds to the deviation between the centers of the circular holes in said sliding plates and said stationary plates.

4,467,718

PRESS BAND ARRANGEMENT FOR DOUBLE-BAND PRESSES

Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,319
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131150
Int. Cl.³ B30B 5/06
U.S. Cl. 100—151 1 Claim



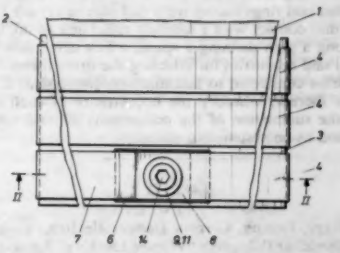
1. A press band arrangement for double-band presses for exercising a surface pressure on plate-shaped workpieces or on material webs which are continuously guided through such presses, comprising press bands (1) formed of multiple layers with each said layer comprising several individual, separate, closely adjacent longitudinal strips (2), a pair of drums (3) disposed in spaced relation with said multiple layers extending over and around said pair of drums, each said longitudinal strip having a pair of longitudinally extending laterally spaced edges, said edges of said longitudinally strips in adjacent said layers of said multiple layers being offset relative to one another transversely of the longitudinal direction of said strips, and border disks positioned at the opposite ends of said drums for holding said strips on said drums.

4,467,719

WEB-FED OFFSET ROTARY PRINTING MACHINE

Heinrich K. Grosshauser, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Aug. 2, 1982, Ser. No. 404,002
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1981, 3131170
Int. Cl.³ B41F 5/06, 13/02
U.S. Cl. 101—221 3 Claims



1. A web-fed rotary printing machine comprising at least first and second spaced satellite printing units for printing on both sides of a paper web passing through said first and second satellite printing units, each of said satellite printing units having at least one counter pressure cylinder, a plurality of blanket cylinders and a plurality of forme cylinders, each of said cylinders running on bearer rings, means to maintain accurate print registry on said web by controlling web tension, said means to maintain print registry including means for varying the diameters of said cylinders and said bearer rings in said first satellite unit with respect to the diameters of said cylinders and bearer rings of said second satellite printing unit in accordance with the type of said paper web being printed on to obtain said accurate print registry by controlling the tension of said web between said first and second satellite printing units, said means for varying the diameters of said bearer rings including at least first and second sets of replaceable hardened metal bands, said bands in said first and second sets being of different thicknesses, with all of said bands in a given set having uniform thicknesses over their entire lengths and uniform thicknesses with respect to each other, said first set of said bands being secured in a staggered, adjacent manner to an inner ring portion of each of said bearer rings whereby the diameters of said bearer rings can be varied by replacement of said first set of bands by said second set of bands.

4,467,720
SPIRAL-TYPE DUCTOR

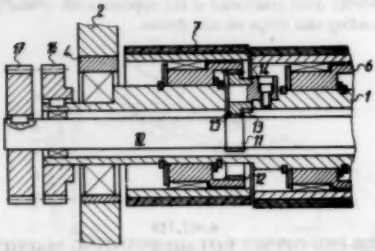
Peter Gertsch, Niederscherli, Switzerland, assignor to Maschinenfabrik Wifag PR, Switzerland

Filed Nov. 3, 1982, Ser. No. 438,972

Claims priority, application Sweden, Jun. 11, 1981, 8106603

Int. Cl.³ B41F *31/14*; B41L *27/28, 27/16*

U.S. Cl. 101—348 **4 Claims**



1. A spiral-type ductor adapted for transferring ink from a fountain roller to a roller for taking up ink of an inking system of a rotary printing press comprising a multi-eccentric shaft having a plurality of eccentric portions disposed in angularly offset relationship therealong, an eccentric rotatably journaled on each of said plurality of eccentric portions of said multi-eccentric shaft, said eccentrics being disposed in angularly offset arrangement relative to one another on said multi-eccentric shaft, a ring mounted for rotation on each of said eccentrics so that said rings successively and alternately are adapted to come into contact with a fountain roller and an ink take-up roller along a path defining a spiral, a first drive means connected to said eccentrics for effecting the drive thereof, and a second drive connected to said multi-eccentric shaft to effect the drive thereof, whereby the eccentricity of each of said rings is the summation of the eccentricity of said eccentric portion and its corresponding eccentric.

4,467,721
INK-APPLYING DEVICE

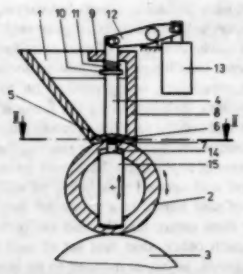
Regina Wege, Leipzig, German Democratic Rep., assignor to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 249,176, Mar. 30, 1981, Pat. No. 4,392,426. This application Nov. 22, 1982, Ser. No. 443,747

Claims priority, application German Democratic Rep., Apr. 15, 1980, 220444

Int. Cl.³ B41F *31/06 31/08, 31/26*; B41L *27/28*

U.S. Cl. 101—363 **6 Claims**



1. In an ink-applying device, comprising a first ink application roller and a funnel-shaped ink reservoir, a combination comprising a dosing device including a rotatable dosing roller positioned between said ink reservoir and said ink application roller, said ink reservoir including a bottom wall formed with a row of conical dosing holes extended longitudinally of said bottom wall and distributed over its entire length, said conical holes in said row being subdivided into groups having varying diameters and each defining an ink zone, said dosing roller including at least one row of dosing chambers formed in a circumferential surface thereof and extended lengthwise of said dosing roller and distributed over the entire length thereof, said conical dosing holes superimposing respective dosing chambers in a predetermined position of said rotatable dosing roller to fill respective dosing chambers with ink; and a plurality of plungers mounted in said ink reservoir and being vertically movable to selectively open respective dosing holes and thereby respective dosing chambers and permit ink to flow thereinto or close respective dosing holes and thus respective dosing chambers to prevent ink from flowing therein so that an adjustable ink dosing is effected over the entire length of the dosing roller.

4,467,722
METHOD AND APPARATUS FOR DRAWING FLEXIBLE PRINTING BLOCKS ONTO PRINTING ROLLERS IN AN IN REGISTER MANNER

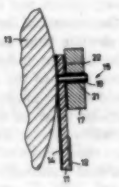
Hannsgeorg Klingelhoefer, Nuertingen, and Klaus-Peter Rudolph, Stuttgart, both of Fed. Rep. of Germany, assignors to Bielomatik Leuze GmbH & Co.

Filed May 18, 1983, Ser. No. 495,638

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221066

Int. Cl.³ B41F *27/00*

U.S. Cl. 101—426 **7 Claims**



1. A method for drawing a pluraltiy of flexible printing blocks onto a printing roller in a registered manner, the blocks having register marks, comprising the steps of:

positively engaging one edge of the blocks by fitting at least one mounting device to the blocks;

fitting the blocks and mounting device to the printing roller in a registered manner by positively engaging the at least one mounting device in a corresponding alignment means;

fixing the blocks to the printing roller; and,

removing the at least one mounting device.

4,467,723
COIL STRIP SAFETY DEVICE FOR SPINNING PROJECTILES

Hans Kaiser, Königsfeld; Walter Winterhalter, Tennenbronn; Karl Wild, Schramberg-Sulgen, and Peter Grüner, Schramberg, all of Fed. Rep. of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Fed. Rep. of Germany

Filed Aug. 17, 1982, Ser. No. 408,811

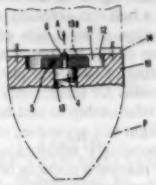
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151470

Int. Cl.³ F42C *15/22*

U.S. Cl. 102—240 **7 Claims**

1. In a fuze arranged for use in a projectile of the spin type, said fuze including a housing, a safety means and a movable firing part which is held against movement by the action of said safety means until the projectile has traveled a preset

distance, said safety means comprising an elastically coiled spring strip arranged within a recess of said housing to block movement of said movable part when in a coiled state and permit movement of said part after being expanded in response to spinning of the projectile, said coil spring strip having a radially outer end spaced radially inwardly from a wall defining said recess, said coil spring strip being formed of steel and having a tensile strength of 1200 to 2800 N/mm^2 and a strip thickness greater than 20 μm to avoid being permanently deformed until unwound in response to a spinning of the projectile, the coiling forces acting on said coil strip being defined solely by said coil strip.

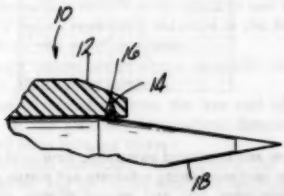


4,467,724

SABOT PROJECTILE CORE RESTRAINT

Darrell W. Marlow, Carbondale, Ill., assignor to Olin Corporation, Stamford, Conn.

Filed Aug. 30, 1982, Ser. No. 413,017
Int. Cl.^{3} F42B *13/16*
U.S. Cl. 102—520 **1 Claim**



1. A discarding sabot projectile which comprises:

a cylindrical projectile core with a rear portion and reduced diameter front portion and a smooth unrecessed exterior,

a sabot radially surrounding said rear portion of said core and having a forward end which has an inwardly facing annular recess at a location radially outward of said front portion of said core, and

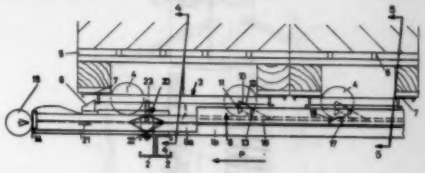
a centrifugally expandable O ring of a cross-sectional body diameter greater than the radial distance between said forward end and said front portion at the location of said sabot recess, said "O" ring positioned partially within said recess when in contact with said smooth reduced diameter front portion, said sabot recess being of a depth greater than said O ring body diameter whereby said O ring can expand outwardly into said recess when said projectile is spun-up during firing.

4,467,725

CONTINUOUS SHELF STORAGE SYSTEM UTILIZING THE GRAVITY FEED PRINCIPLE

Hans R. Haldimann, Montagnola, Switzerland, assignor to Tortuga S.A., Luxembourg, Luxembourg

Filed Feb. 24, 1982, Ser. No. 351,655
Claims priority, application Switzerland, Feb. 25, 1981, 1242/81
Int. Cl.^{3} B61B *13/12*
U.S. Cl. 104—162 **4 Claims**



1. In a continuous shelf storage system in which goods to be stored are placed in mobile storage and transporting units on shelves, these units each provided a load bearing pallet, a vehicle body and rollers which roll on a pair of rails which are only slightly inclined;

a motional impulse generator which is longitudinally displaceable in the center of the spacing between said pair of rails adapted to push one of said units for movement along said pair of rails by a distance of at least several vehicle lengths without requiring braking before coming to a standstill, said generator comprising:

a thrust rod assembly formed of an elongated rod member having a push engaging forward end for pushing engagement against the rear of a vehicle and a spring at the end remote from the push engaging forward end, said spring urging said elongated rod member into a locked non-operative position;

a locking device at the push engaging forward end of said thrust rod assembly to lock said assembly in a position to avoid pushing the unit and thereby place the thrust rod assembly in a non-operative position;

pivotable pawls connected to the forward end of said elongated rod member which fit against the unit to adapt the rod member to push said unit when the pawls are pivoted with one surface engaging the unit and adapting the rod member to disengage from the unit when moved away about the pivots of the pivotable pawls to release the assembly from the unit;

wedge shaped guide shoes, one for each pawl, guiding the surface of each pawl in its pushing relation to the end of the mobile unit; and

said locking device being displaceable from a locking position to an open position by a first rolling unit when the unit is removed, the wedge shaped guide shoes guiding the pawls under spring action of the thrust rod assembly to bring the guide shoes to a ready position for pushing the next unit.

4,467,726

STABILIZING APPARATUS

Derek R. Aldous, Wembley, and Robert J. Melling, Watford, both of England, assignors to British Telecommunications, London, England

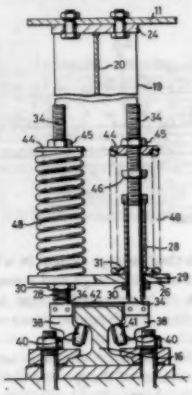
Filed Oct. 27, 1981, Ser. No. 315,545
Claims priority, application United Kingdom, Oct. 28, 1980, 8034668
Int. Cl.^{3} B61F *9/00*
U.S. Cl. 104—246 **12 Claims**

4. A mounting arrangement for a tracking communications antenna comprising:

a support rail having upwardly and downwardly facing bearing surfaces,

a mounting platform comprising a frame to support said antenna, and a plurality of wheels arranged to run on said upwardly facing bearing surface,

said mounting platform further comprising stabilizing means including a first substantially rigid element which depends from the platform and which has a first reaction surface, a



second substantially rigid element which has means arranged to engage said downwardly facing bearing surface and defines a second reaction surface, said first and second elements being moveable axially relative to each other, and biasing means acting on said first and second reaction surfaces so that, in use, said engaging means is maintained in contact with said rail surface and any tendency of the wheels to rise is resisted by the action of said biasing means on said first reaction surface.

4,467,727

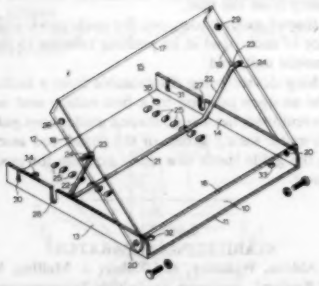
LIGHT BOX APPARATUS

Stanley R. Strommer, 1729 N Snelling Ave., Falcon Heights, Minn. 55113

Filed Sep. 16, 1982, Ser. No. 418,722

Int. Cl.³ A47B *85/00*

U.S. Cl. 108—23 **4 Claims**



1. A collapsible, easily cleaned, flat folding, storable, lightweight, readily portable and adjustable artist's light box apparatus, consisting of a base plate having no upward flange along the forward and rear edges thereof but having an upwardly flanged section along each side edge thereof, an upper transparent plate wholly of organic plastics material in spaced relationship over said base plate, said upper transparent plate having a downwardly flanged section along each side edge thereof but no downwardly flanged section along the forward and read edges thereof, hinge means adjacent forward portions of the side edge flange sections of said transparent plate said base plate for pivotal elevational tilting of said transparent plate above said base plate, adjustable means for temporarily locking said transparent plate at any of a multiplicity of preselected tilt angles with respect to said base plate, said adjustable means comprising a bail rod pivotally mounted in the downwardly flanged section of each side edge of the transparent plate, friction means on the bottom of said base plate for antislip temporary resting of said base plate on a planar surface, and snap closure means for temporarily locking said transparent plate in folded relationship to said base plate for storage or portability of said light box apparatus, said snap closure means consisting of cooperatively interlocking functional elements located at adjacent rearward portions of said side edge flanged sections of said transparent plate and said base plate, the total thickness of said light box apparatus being no greater than about one inch when said transparent plate is temporarily locked in folded relationship to said base plate, and said pivotally mounted bail rod being further characterized by being pivotable to extend outside the rear edges of the base plate and transparent plate and serve as a carrying handle when said plates are temporarily locked in said folded relationship.

4,467,728

COMPOSITE STRUCTURAL MATERIAL AND METHOD WITH LOAD BEARING APPLICATIONS

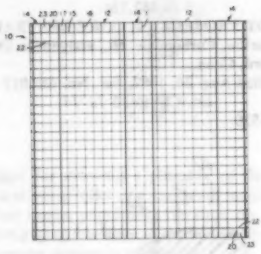
Fred H. Horne, Rye, N.H., assignor to Ellis Paperboard Products, Inc., Portland, Me.

Filed Aug. 17, 1981, Ser. No. 293,668

The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.

Int. Cl.³ B65D *19/32, 19/34;* **B32B** *23/08;* **B05D** *7/00*

U.S. Cl. 108—51.1 **11 Claims**



1. A new and improved monolithic structural material comprising: an interpenetrating substrate and plastic material composite comprising first and second phases, said composite characterized by intimate physical and chemical bonding between the phases;

said first phase comprising a substrate of absorbent fiber-like material forming a continuous phase fibrous network filler;

said second phase comprising a polymerized plastic material extending thoughout and filling the voids and interstices of the fibrous network of the fiber-like material first phase, said second phase derived by in situ polymerization from a solvolysis system including at least a dissolved starting polymer substance and solvent in which the solvent reacts with the dissolved substance, said solvolysis system adapted for saturating and penetrating rather than merely coating the interstices and voids of the fiber-like material first phase, and for reacting and polymerizing throughout the fibrous network of the first phase;

and at least one laminate coating of an agglomerating plastic material adherent and chemically bonding to the surface

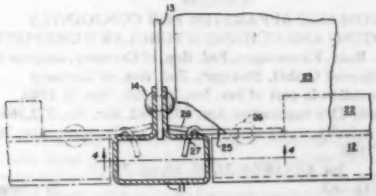
of said plastic material and substrate composite, said at least one laminate coating derived by in situ polymerization from a similar solvolysis system adjusted to have agglomerative characteristics for coating rather than saturating, said adjusted solvolysis system adapted to liquify the outer surface of the composite for chemical bonding and interpolymerization at the interface between the coating and the composite whereby said composite and at least one coating form a monolithic structural material.

4,467,729

WIDE SPAN SHELVING

Daniel J. Featherman, Philadelphia, Pa., assignor to Franklyn Featherman and Bernard Featherman, both of Philadelphia, Pa.

Filed Feb. 19, 1982, Ser. No. 350,234
Int. Cl.³ A47F 5/10
U.S. Cl. 108—107 **4 Claims**



1. A shelved storage rack structure comprising end frames having end posts and bracings and cross-beams connecting the end frames, the improvement wherein each cross-beam comprises:

a vertical panel and at least one outwardly, generally horizontally extending flange adapted to support a storage rack deckplate and comprised of a reverse bend in the material of fabrication whereby to structurally rigidify and strengthen the cross-beam;

said vertical panel being at each end longitudinally extended at an intermediate section with regard to said flange;

a connector means removably fastened to the longitudinal face of each said panel extension;

the connector means comprising a vertically oriented and generally planar plate member;

first tab means extending from the free end of the plate member in the generally longitudinal direction of said panel and plate fastened thereto;

further tab means extending from the said free end of the plate member and also in the generally longitudinal direction of said panel and plate fastened thereto;

said further tab means being inwardly directed at the ends thereof and configured in the form of downwardly directed hook means;

said hook means lying intermediate the longitudinal extent of the first tab means;

said posts each being apertured on the face thereof associated with the broad plane of said vertical panel and plates and in operative association with each of said first tab and said further tab and hook means; and

said hook means being configured to firmly secure the aperture defining post structure while said first tab means associate with the apertured face of the posts whereby to enhance the stability of the interconnection between the posts and cross-beams;

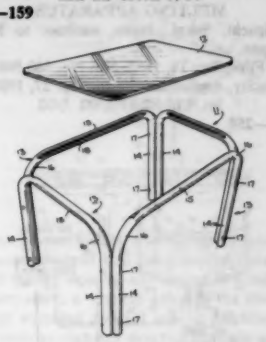
whereby said storage rack structure is particularly suited to be of lightweight construction and easily assembled and disassembled.

4,467,730

TABLE WITH RELEASABLE TOP

Donald J. Borichevsky, Rutland County, Vt., assignor to The Telescope Folding Furniture Co. Inc., Granville, N.Y.

Filed Jan. 4, 1982, Ser. No. 337,083
Int. Cl.³ A47B 3/06
U.S. Cl. 108—159 **13 Claims**



1. A table comprising

a plurality of leg frames, at least two opposed leg frames having a horizontal tubular cross-bar deformed to define a longitudinally disposed recess with an overhanging lip along an upper edge of said recess and being adapted to spring apart from each other; and

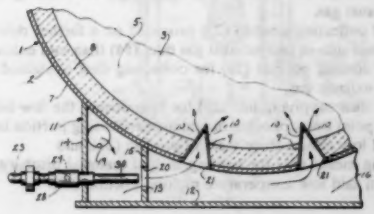
a table top having a peripheral edge snap-fitted in said recesses of said cross-bars with each lip of a respective cross-bar overhanging and peripheral edge of said table top.

4,467,731

STEAM INJECTION SYSTEM FOR AN INCINERATOR

Mark A. Di Fonzo, Brookfield, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed Aug. 13, 1982, Ser. No. 407,954
Int. Cl.³ F23G 5/00
U.S. Cl. 110—235 **3 Claims**



1. A steam injection system for an incinerator, comprising an incinerator defining a combustion chamber and having air inlet means disposed at the lower end of the combustion chamber, a plenum disposed outside of said incinerator adjacent the lower end thereof and defining a plenum chamber, said plenum chamber being in communication with said air inlet means, air supply means for introducing air into said plenum chamber, a steam supply line connected to a source of steam under pressure, outlet tube means connected to said steam supply and terminating in said plenum chamber for directing steam into contact with the outer surface of said incinerator, said steam being mixed with air in said plenum chamber and the mixture being fed through said air inlet means to the combustion chamber to thereby reduce high localized temperatures in said combustion chamber, and including an orifice disposed upstream from the discharge end of said outlet tube means, said orifice

having a smaller cross-sectional area than said discharge end to thereby reduce the velocity of the steam entering said plenum chamber.

4,467,732

MELTING APPARATUS

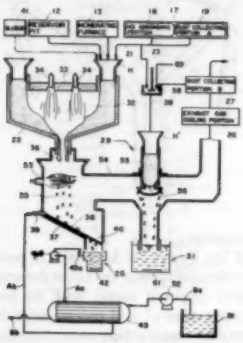
Kotaro Taniguchi, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Sep. 19, 1983, Ser. No. 533,506

Claims priority, application Japan, Sep. 27, 1982, 57-146455

Int. Cl.³ F23G *3/00, 7/00*

U.S. Cl. 110—259 **7 Claims**



1. A melting apparatus comprising:

a melting furnace (**22**) for melting a waste and discharging a slag from a discharging port thereof,

an exhaust gas duct (**54**) diverged from the slag discharging port of said melting furnace for discharging an exhaust gas generated in said melting furnace,

a low temperature melting portion (**29**) provided in said exhaust gas duct (**54**) for melting low boiling point dust contained in the exhaust gas,

an exhaust gas cooling portion (**26**) provided on a farther downstream side of said exhaust gas duct (**54**) than said low temperature melting portion (**29**) for cooling the exhaust gas,

a dust collecting portion (**27**) provided on a farther downstream side of said exhaust gas duct (**54**) than said exhaust gas cooling portion (**26**) for collecting dust contained in the exhaust gas,

a first dust supplying line (**28**) for introducing the low boiling point dust collected in said dust collecting portion into said low temperature melting portion (**29**), and

cooling means (**31**) for cooling melted material discharged from said low temperature melting portion (**29**).

4,467,733

DEVICE FOR WORKING THE HEM OF TUBULAR PIECES OF GARMENT

Alfred Martin, Rheinstetten-Forcheim, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

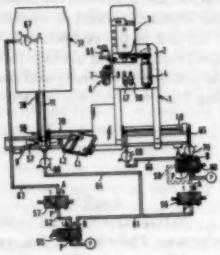
Filed Jan. 13, 1984, Ser. No. 570,520

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 8302034[U]

Int. Cl.³ D05B *23/00*

U.S. Cl. 112—2 **9 Claims**

1. A device for sewing tubular workpieces with a sewing machine, comprising a workpiece holder, rotation means engageable with said workpiece holder to rotate said holder, first setting means engageable with said rotation means to shift said rotation means with said workpiece holder backwardly and forwardly relative to the sewing machine along a first directional path, and second setting means connected to said first setting means to shift said second setting means backwardly



and forwardly relative to the sewing machine along a second path disposed at an angle to said first path.

4,467,734

AUTOMATIC APPARATUS FOR CONJOINTLY SUPPORTING AND GUIDING A TUBULAR WORKPIECE

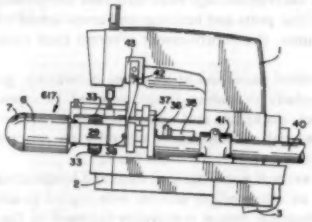
Gunter H. Rohr, Hemmingen, Fed. Rep. of Germany, assignor to Union Special GmbH, Stuttgart, Fed. Rep. of Germany

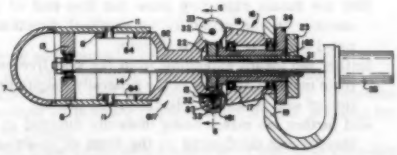
Continuation-in-part of Ser. No. 203,209, Nov. 3, 1980, abandoned. This application Apr. 27, 1982, Ser. No. 372,366

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117198

Int. Cl.³ D05B *23/00, 35/06, 35/10*

U.S. Cl. 112—63 **29 Claims**





1. In combination with a sewing machine having stitch forming instrumentalities for working on an advancing tubular workpiece edge and means for forming a fold in the tubular workpiece edge at a position in front of the stitch forming instrumentalities, an apparatus for moving the workpiece edge past the stitch forming instrumentalities comprising:

at least two mechanically driven rotatable support means adapted to receive and concomitantly advance the open end of said tubular workpiece;

mechanically driven positioning means including a series of annularly arranged wheels located adjacent the open end of said tubular workpiece and adapted for rotation with said support means for controlling the lateral disposition of the workpiece edge; and

sensor means for detecting lateral deviation of the work-

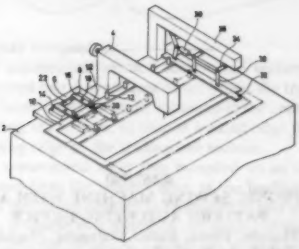
piece edge beyond a predetermined range and for controlling the influence of said positioning means on said workpiece edge.

4,467,735

SEWING MACHINE INCLUDING WORKPIECE CLAMPING DEVICE

Yaacov Sadeh, Beersheva, Israel, assignor to Beta Engineering & Development Ltd., Beersheva, Israel

Filed Jul. 22, 1982, Ser. No. 400,712
Claims priority, application Israel, Sep. 16, 1981, 63857
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **8 Claims**



1. A sewing machine including a main frame, a sewing machine head mounted thereon, a carriage movable over said main frame, and a workpiece clamp carried by said carriage and movable relative to said sewing machine head to locate the workpiece with respect thereto; characterized in that said machine further includes:

a clamp securing device carried by said carriage and releasably attachable to said workpiece clamp to any one of a plurality of locations on said clamp so as to selectively locate said clamp with respect to said carriage, and thereby the workpiece carried by the carriage with respect to said sewing machine head;

and a clamp holding device selectively actuable to immobilize said clamp with respect to said main frame when said securing device has been detached from said clamp and until the securing device is reattached at another location on said clamp.

8. A clamping device for a sewing machine including a main frame, a sewing machine head mounted thereon and a carriage movable over said main frame, said clamping device comprising a mounting member adapted to be mounted to said carriage, a pair of arms pivotably mounted to said mounting member, and a workpiece clamp including a plurality of attaching pins equally spaced along one axis of movement of the carriage with respect to the machine main frame, said pair of arms of the mounting member being actuable to a locking position engaging a selected pair of said attaching pins to secure said clamp at a selected location thereof to said carriage, or to a release position disengaging said attaching pins to permit the pivotable arms to engage another pair of said attaching pins and thereby to secure said clamp to said carriage at another selected location thereof.

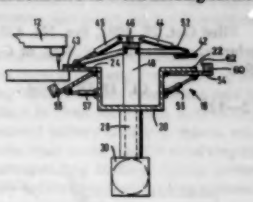
4,467,736

AUTOMATIC APPARATUS FOR EXECUTING SEWINGS ACCORDING TO A DETERMINED CONTOUR

Silvano Perlino, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Apr. 27, 1983, Ser. No. 489,147
Claims priority, application Italy, May 17, 1982, 42906 A/82
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—121.14 **1 Claim**

1. Automatic apparatus for executing sewings according to a determined contour, comprising a sewing machine arranged to carry out movements along two orthogonal axes following path whose points are determined according to data stored in a memory, a pivotal work support having a work holdup surface on only one side thereof comprising a sewing station and a loading station defining two symmetrically disposed and equally shaped portions on said work holding surface on which



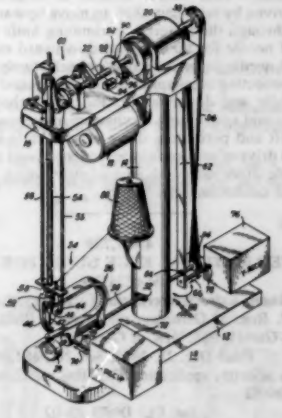
the fabric to be worked is alternatively loaded and sewn, clamping means to hold said fabric on said shaped portions prior to and during sewing, and means to axially rotate said work support along a vertical axis 180° at the end of each sewing cycle executed by said sewing machine, the sewing path, every time moving in a direction opposite to the previous one.

4,467,737

PROGRAMMABLE SEWING MACHINE

Louis W. Breck, Jr., 8 Joe Turner Ct., El Paso, Tex. 79915

Filed Dec. 5, 1983, Ser. No. 557,900
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—121.14 **12 Claims**



1. Sewing machine device comprising a base; a stitching head assembly suspended above said base for movement in two horizontal dimensions, the stitching head assembly including a frame, a needle bar mounted for vertical reciprocal movement and supporting a stitching needle, and a clamp foot for clamping a workpiece to said frame during a stitching movement of said needle; stitching drive means mounted at a position on said device apart from said stitching head assembly for generating reciprocating motion to be imparted to said needle bar and said guide foot; flexible drive and support means for suspending said stitching head a predetermined distance above said base and transmitting said reciprocating motion from said stitching drive means to said needle bar and said clamp foot; and stitching head driving means for moving said stitching head, relative to said base, through a stitching pattern in said two horizontal dimensions.

4,467,738

DETACHABLE DRIVE FOR SEWING MACHINE TRIMMING KNIFE

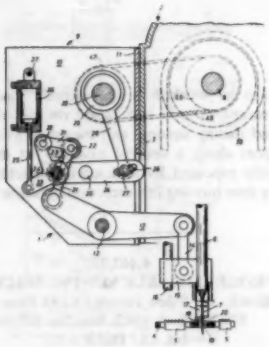
Karl-Heinz Walther; Kurt Vollmar, both of Weilerbach, and Albert Dusch, Kaiserslautern, all of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Oct. 20, 1982, Ser. No. 435,498

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1981, 3144966

Int. Cl.³ D05B *37/04*

U.S. Cl. 112—129 10 Claims



1. A sewing machine comprising a rotatable main shaft, a sewing station over which material to be sewn is moved, a needle driven by said main shaft to move upwardly and downwardly through the material, a trimming knife mounted adjacent said needle for upward and downward movement adjacent said needle to periodically and selectively cut the material, a connecting mechanism connected to said knife to move it upwardly and downwardly, and a detachable drive connected to said connecting mechanism and connectable to said main shaft and permitting drive of said knife with said main shaft and drive of said knife independent of said main shaft, said detachable drive including an eccentric which is rotatable to drive said connecting mechanism.

4,467,739

SEAMED MATERIAL EDGE GUIDE FOR A SEWING MACHINE

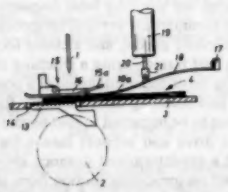
Walter Hager, Kaiserslautern, and Kurt Petry, Stelzenberg, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Dec. 28, 1982, Ser. No. 454,050

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3206682

Int. Cl.³ D05B *35/02*

U.S. Cl. 112—153 5 Claims



1. A sewing machine have a reciprocating needle for sewing a multi-layer workpiece such as a collar which has a plurality of edges disposed to angles to each other, comprising a guide fence having a guide edge corresponding to the circumferential shape of the workpiece for an edge parallel seam extending alongside the needle and against which guide edge the material is guided, feed means engageable with the workpiece for advancing it past the needle, a presser foot engageable with the workpiece over said feed means and having an infeed end extending upwardly away from the workpiece, and a holddown overlying the workpiece and having a portion extending into the infeed end of said presser foot and engageable with the workpiece and guiding the layers of the workpiece into a position parallel to said guide edge.

4,467,740

ELECTRONIC SEWING MACHINE WITH A STITCH PATTERN ADJUSTING DEVICE

Hachiro Makabe, Fussa; Kazuo Watanabe, Hachioji, and Yoshitaka Takahashi, Koganei, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

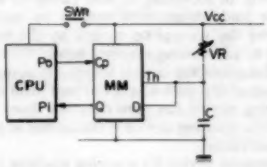
Continuation of Ser. No. 61,307, Jul. 27, 1979, Pat. No. 4,261,271. This application Nov. 12, 1980, Ser. No. 205,968

Claims priority, application Japan, Aug. 11, 1978, 53-97337

The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—158 E 2 Claims



1. A sewing machine having an electronic memory storing stitch control signals which are sequentially read out in synchronism with rotation of the upper drive shaft of the sewing machine to control at least one of the needle swinging amplitude and the feeding amount, thereby to form a pattern of stitches, a number of pattern selecting switches each selectively operated to select a pattern of stitches, each stitch being produced by a predetermined needle swinging amplitude and a predetermined feeding amount, comprising stitch adjusting means manually operated to vary at least one of the needle swinging amplitude and the feeding amount per each stitch of the selected pattern, a switch which is closed by one mode of operation of the stitch adjusting means, a capacitor charging circuit including a capacitor and a variable resistor, the value of said variable resistor being determined by another mode of operation of the stitch adjusting means, thereby to determine the time constant of the circuit, a monostable multivibrator producing a signal in a time based on the charging time of the capacitor charging circuit, and a microcomputer including a central processing unit detecting and memorizing the manual operations of the specific pattern selecting switches and the stitch adjusting means, and digitally counting and calculating the signals from the monostable multivibrator, thereby to make the stitch adjusting means effective or ineffective.

4,467,741
SAIL ARRANGEMENTS

John G. Walker, Hamble, England, assignor to Walker Wingsail Systems Limited, London, England

Filed Mar. 9, 1982, Ser. No. 356,415
Claims priority, application United Kingdom, Mar. 19, 1981, 8108575; Aug. 4, 1981, 8123831; Aug. 25, 1981, 8125958
Int. Cl.³ B63H 9/04
U.S. Cl. 114—103 6 Claims

1. A wingsail comprising:

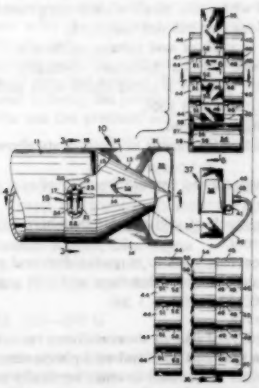
two rigid symmetrical aerofoil section sail sections which are mounted one downstream of the other, the trailing sail section being freely pivotally mounted to the center line of the leading sail section, so that its leading edge just clears the trailing edge of the leading sail section;

a hinged symmetrical rigid flap mounted so as to extend downwind from the trailing edge of the leading sail section, the flap being adapted to be moved to one side or the other in response to a swinging movement of the trailing sail section relative to the leading sail section so that the leeward surface of the flap can form a more or less smooth extension of the leeward surface of the leading sail section, a spacing being defined between the flap and the trailing sail section and forming a convergent linear nozzle so as to assist in directing air over the leeward surface of the trailing sail section and energize the local flow, prolong the extent of attachment of flow and enable an optimum thrust coefficient to be reached.

4,467,742
BATTERY-POWERED PROPULSION UNIT FOR A DIVER

Gustavo Duboy, 18801 NW. 49th Ct., Carol City, Fla. 33055

Filed Jul. 26, 1982, Ser. No. 402,146
Int. Cl.³ B63C 11/02, 11/46
U.S. Cl. 114—315 9 Claims



1. In a propulsion unit for underwater breathing apparatus including a tank worn on a diver's back, said apparatus having

a housing,

an electric motor in said housing,

a propellor operatively coupled to said motor at one end of said housing,

and means for mounting said housing on said tank, the improvement which comprises:

means for holding a plurality of batteries on the waist of a diver wearing the breathing apparatus;

and flexible cable means extending from said battery holding means to said motor for connecting the batteries electrically to the motor, said means for holding batteries further comprising:

a plurality of first battery holder members, each defining a tubular recess open at one end for receiving one end of a corresponding battery, means connecting said first battery holder members in close succession next to one another;

a plurality of second battery holder members, each defining a tubular recess open at one end for receiving the opposite end of a corresponding battery, means connecting said second battery holder members in close succession next to one another;

and a flexible belt coupled to said first and second battery holder members and holding them end-to-end with the recess in each second battery holder member registering with the recess in a corresponding first battery holder member to define a compartment for holding a corresponding battery;

said means connecting said first battery holder members comprising webs extending between successive first battery holder members;

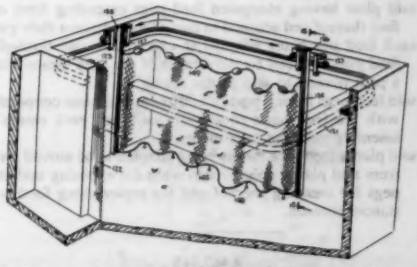
and said means connecting said second battery holder members comprising webs extending between successive second battery holder members; and further comprising:

a plurality of releasable fingers attached respectively to said first and second battery holder members, said fingers extending closely parallel to the respective webs and engaging the outside of the belt to hold the belt tightly against the adjacent first and second battery holder members.

4,467,743
METHOD AND APPARATUS FOR REARING POST-LARVAE SHRIMP

Charles Dugan, Goulds, and Timothy Dugan, Homestead, both of Fla., assignors to Farm Fresh Shrimp Corporation, Fort Lauderdale, Fla.

Division of Ser. No. 952,664, Oct. 19, 1978, Pat. No. 4,285,298. This application May 14, 1982, Ser. No. 263,364
Int. Cl.³ A01K 61/00
U.S. Cl. 119—2 3 Claims



1. A system for rearing post-larvae shrimp comprising:

a tank for retaining said shrimp and a medium, said tank including a sidewall having an opening therein and closure means comprising a movable screen for selectively permitting and preventing passage of shrimp through said opening; and

means for culling from the total population of shrimp retained within said tank a shrimp subpopulation comprising shrimp which have achieved a predetermined size and for confining said culled shrimp to a localized area within said tank, said localized area including said opening, said cull-

ing means including a slotted track extending around the periphery of said tank and having opposite ends which terminate on opposite sides of said opening, said culling means further including mesh net means having mesh openings approximately equal in size to shrimp which have achieved said predetermined size and opposite ends for engaging said track and moving in opposite directions in said track and including:

first and second bars each of a length which spans the distance between the bottom of said tank and the upper surface of said track;

first and second guide means attached to said first and second bars for guiding said bars in said slot; and

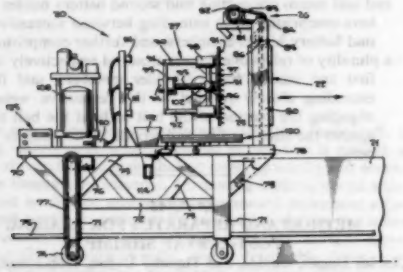
a net having an end attached to said first elongated bar and an opposite end attached to said second elongated bar, the openings of said net defining said mesh openings.

4,467,744

APPARATUS AND METHOD FOR RAISING LOBSTERS

Jonathan D. Handrus, Carlsbad, Calif., assignor to Mark C. Davidson, Los Angeles, Calif.

Filed Sep. 30, 1982, Ser. No. 428,983
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—2 **25 Claims**



15. In an aquaculture apparatus for raising crustaceans, such as, lobsters, comprising in combination:

a cage means having a plurality of individual enclosed cells arranged in rows, each cell having a wall provided with a feed port, said walls lying in the same planar zone;

a planar feed rack means including a plate positionable in a planar zone parallel to the planar zone of said walls,

said plate having elongated feed pegs extending from one face thereof and adapted to carry food adjacent their ends,

each feed peg being adapted to extend into and through a feed port of a cell by movement of the rack means along a path normal to said planar zones;

said feed pegs having portions adjacent said plate cooperable with the feed ports to support said feed rack means in assembly with the cage means;

said planar feed rack means being adapted to be moved away from said planar zone of said walls for exposing said feed pegs for cleaning thereof and for replenishing food substances thereon.

4,467,745

CHICKEN HARVESTING MACHINE

Lloy W. Ledwell; Stephen H. Ledwell, and Bobby W. Nolte, all of Texarkana, Tex., assignors to Ledwell & Son Enterprises, Inc., Texarkana, Tex.

Filed Jul. 8, 1983, Ser. No. 511,874
Int. Cl.³ A01K *29/00*
U.S. Cl. 119—82 **32 Claims**

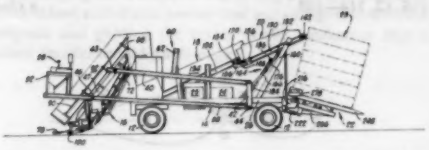
27. A machine for gathering and cooping chickens on the ground comprising:

means for automatically lifting up the chickens and moving them to an elevated position to a conveyor means, said conveyor means then moving the chickens toward a cooping station; and

means for supporting a chicken coop including:

means for moving the coop toward the conveyor means;

means for tilting the coop to facilitate gravity deposition of chickens therein from the conveyor means;



means for clamping the opposite sides of the coop while the coop is tilted to facilitate gravity deposition of chickens therein; and

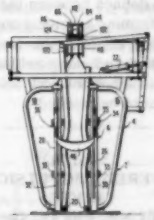
means for horizontally indexing the coop relative to the conveyor means to align first one side and then a different side of the coop with said conveyor means.

4,467,746

ANIMAL MUGGER

Curtis R. Waldron, Rte. 3, Box 2793, Okeechobee, Fla. 33472

Filed Sep. 3, 1982, Ser. No. 414,801
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—99 **5 Claims**



1. A mugger for use with a cattle chute having moveable sides and pivoted entrance and exit gates to immobilize the head of a cattle held within the chute which comprises:

first and second elongated tubular members,

a longitudinal slot in each of said tubular members,

means to mount said tubular members vertically on the outside of the exit gate of a cattle chute with said slots facing away from said exit gate,

piston means having a free end,

means to mount said piston means to reciprocate above said chute,

a first pair of sheaves carried by said free end of said piston means,

a sheave carried by each of said tubular members adjacent the top ends thereof,

a second pair of sheaves, means to mount said second pair of sheaves above said chute and between said exit gate and said piston means,

a third pair of sheaves,

means to mount said third pair of sheaves above said second pair and between said exit gate and said piston means,

a first bracket member structured to slide vertically in said slot of one of said tubular members,

a second bracket member structured to slide vertically in said slot of the second of said tubular members,

a sling member defined by a front, a rear, a two sides fixed at one side to said first bracket member and fixed at the other side to said second bracket member,

a first cable fastened at one end to said first bracket member

passing in turn over said tubular member carried sheave, one of said sheaves of said second pair, one of said sheaves of said third pair and over a sheave of said first pair, and a second cable passed in like manner around the second sheaves of said various pairs.

4,467,747

FLUID-FRICTION CLUTCH

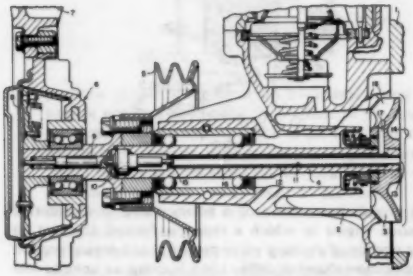
Andreas Braatz, Rutesheim; Johann Weintz, Freiberg, and Wolf-Dieter Kurz, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,675

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140195

Int. Cl.³ F01P *5/02*

U.S. Cl. 123—41.12 **4 Claims**



1. a fluid-friction clutch for a cooling fan of an internal combustion engine, having a valve lever means for controlling a valve between a supply chamber and a driving chamber, comprising

temperature-dependent operating means including an expansion-type thermostat element acting on the valve lever means,

said fluid-friction clutch being fitted on the water-pump shaft driving the impeller of the water pump, said shaft including a first bore,

the expansion-type thermostat element being mounted in the vicinity of the fluid-friction clutch in the first bore inside the water-pump shaft, the first bore being in communication with the cooling water of the internal combustion engine, and

means for enabling a stream of cooling water to be continuously directed around the expansion-type thermostat element utilizing the pressure-difference between the suction side and the pressure side of the water-pump impeller.

4,467,748

START CONTROL DEVICE IN FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yukihiro Watanabe, Nagoya, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

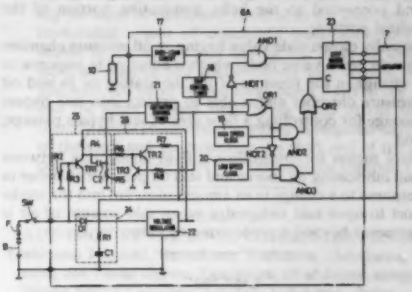
Filed Jun. 28, 1983, Ser. No. 508,543

Claims priority, application Japan, Oct. 30, 1982, 57-191022

Int. Cl.³ F02N *17/00*

U.S. Cl. 123—179 G **10 Claims**

1. A start control device in a fuel supply system for an internal combustion engine which includes an actuator having a step motor therein as a drive source and a control circuit for controlling said step motor wherein said actuator serves to control at least one of the amounts of fuel and air to be supplied to said engine, said start control device comprising a power-off detecting circuit for detecting stop of power supply to said control circuit, an auxiliary power circuit for supplying electric power to said control circuit and said step motor for a predetermined period of time in response to a detecting signal from said power-off detecting circuit and an actuator driving timer for feeding a predetermined actuating signal to said step



motor in response to said detecting signal from said power-off detecting circuit.

4,467,749

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT

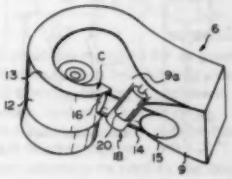
Yorishige Maeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

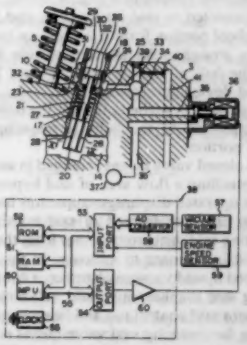
Filed Jul. 2, 1982, Ser. No. 394,872

Claims priority, application Japan, Jul. 15, 1981, 56-109224; Jul. 15, 1981, 56-109225; Jul. 15, 1981, 56-103782[U]; Jul. 15, 1981, 56-103783[U]

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—188 M **20 Claims**





1. A device for controlling flow in a helically-shaped intake port of an internal combustion engine, said intake port comprising a helical portion formed around an intake valve, and a substantially straight inlet passage portion tangentially con-

nected to the helical portion and having a helix terminating portion, said device comprising:

a lubricating oil source;

a bypass passage branched off from the inlet passage portion and connected to the helix terminating portion of the helical portion;

a normally closed slide valve having an oil pressure chamber therein and a valve body which is actuated in response to a change in the pressure of the lubricating oil in said oil pressure chamber and is able to project into said bypass passage for controlling a flow area of said bypass passage; and

control means for controlling a fluid connection between said lubricating oil source and said oil pressure chamber in response to a change in an amount of air fed into the intake port to open said slide valve when said amount of air is increased beyond a predetermined value.

4,467,750

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT

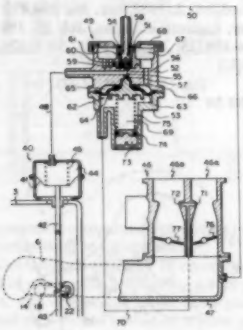
Kiyoshi Isogai, Toyota; Itsuo Koga, Okazaki; Yutaka Yamada, Hekinan, and Kazumi Haruta, Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Industry Co., Ltd., both of Aichi, Japan

Filed Aug. 12, 1982, Ser. No. 407,615

Claims priority, application Japan, Nov. 4, 1981, 163722[U]

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—188 M **14 Claims**



1. A device for controlling flow in a helically-shaped intake port of an internal combustion engine having an intake passage which is connected to said intake port, said intake port comprising a helical portion formed around an intake valve, and a substantially straight inlet passage portion tangentially connected to the helical portion and having a helix terminating portion, said device comprising:

a bypass passage branched off from the inlet passage portion and connected to the helix terminating portion of the helical portion;

normally closed valve means arranged in said bypass passage for controlling a flow area of said bypass passage;

a vacuum operated diaphragm apparatus having a housing, a vacuum chamber formed in said housing, a diaphragm separating said vacuum chamber from the atmosphere and actuated in response to a change in the level of vacuum produced in said vacuum chamber, a control rod interconnecting said diaphragm to said valve means, a first stop fixed onto said control rod and being engageable with said housing for retaining said valve means at a full open position, and a second stop fixed onto said control rod and being engageable with said housing for retaining said valve means at the completely closed position; and

control means selectively connecting said vacuum chamber to the atmosphere or said intake passage in response to a change in the amount of air fed into said intake passage for retaining said valve means at the full open position or at the completely closed position when said amount of air is larger or smaller than a predetermined level, respectively.

4,467,751

SEALING STRUCTURE OF A ROTARY VALVE IN AN INTERNAL COMBUSTION ENGINE

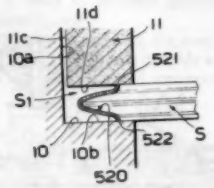
Urataro Asaka; Noboru Kurata, both of Kami-fukuoka, and Masanori Masumura, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 050,321, Jun. 20, 1979, abandoned. This application Dec. 7, 1981, Ser. No. 328,390

Claims priority, application Japan, Jun. 22, 1978, 53-85553

Int. Cl.³ F01L *7/16*

U.S. Cl. 123—190 E **4 Claims**



1. In a sealing structure of a rotary valve in an internal combustion engine in which a recess is formed adjacent an opening portion of a rotary valve proper at an opening portion of a combustion chamber defined in a housing; an annular seal member slidably fitted in said recess is resiliently pushed against an opposing part of said rotary valve proper by means of a resilient means; said resilient means comprises an annular spring interposed between a lower surface of said seal member and an opposite bottom surface of said recess such that said annular spring is in contact at one point with said lower surface of said seal member and at another point with said bottom surface of said recess; and an inward space at the side of a combustion chamber opening and an outward space at the side of an inner wall of said recess being separated from each other by said annular spring, which is formed of one complete piece; the improvement wherein:

said annular spring has substantially a laid-down V-shaped cross-section opened to high pressure gas at the inner diameter side thereof;

said spring having upper and lower ends at only the inner diameter side of said spring which are respectively in free contact with said lower surface of said seal member and said opposite bottom surface of said recess; and

said upper and lower ends of said laid-down V-shape of the cross-section of said annular spring are directed and extend respectively upwardly and downwardly therefrom, said upper and lower ends having end surfaces which are in free contact with said lower surface of said seal member and said opposite bottom surface of said recess, respectively, such that leakage of high pressure gas from inside said annular spring is prevented at said free contact end surface of said ends of said annular spring.

4,467,752

INTERNAL COMBUSTION ENGINE

Henry Yunick, Daytona Beach, Fla., assignor to MotorTech, Inc., Daytona Beach, Fla.

Filed Jun. 21, 1982, Ser. No. 390,525

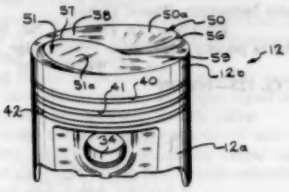
Int. Cl.³ F02B *17/00*

U.S. Cl. 123—193 P **19 Claims**

1. In an internal combustion engine having a cylinder, a cylinder head and a piston mounted within said cylinder for reciprocating movement towards and away from said cylinder

head, structure for inducing rotative movement in a fuel/air mixture within the cylinder, prior to and after combustion, comprising:

(a) at least two substantially similar projections rising upwardly from a top surface of said piston, said projections disposed symmetrically about a central axis of said piston and disposed in a side-by-side, interfitting yin and yang relationship, said projections at least partially defined by a common contoured boundary line that intersects the central axis of the piston, each projection including an inclined, lateral surface, that merges with horizontal surface



portions of said piston having a horizontal extent of said surface portions decreasing from a base of the associated projection, and an upper portion of each projection terminating in a circular edge surface said projections and piston top surface act as means for inducing said rotative movement wherein said rotative movement formed thereby goes about the axis across all of said projections and piston top surface;

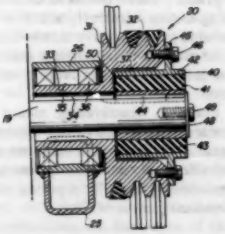
(b) said cylinder head defining a wall of a combustion chamber, said wall including recesses shaped to receive the projections on said piston when said piston is located at top-dead-center.

4,467,753

VIBRATION DAMPENER ON ENGINE SHAFT

Henry J. Lange, Juneau, Wis., assignor to Deere & Company, Moline, Ill.

Filed Jul. 31, 1981, Ser. No. 288,851
Int. Cl.³ F02F 7/00
U.S. Cl. 123—195 A **4 Claims**



1. A suspension system for mounting an engine on a supporting structure, said engine having a vibrating-inducing power unit with an external power shaft, said system comprising:

a vibration dampening engine mount structure supporting the engine on the supporting structure near the center of gravity thereof;

a pulley concentric with and out of contact with the shaft, having a hub end and a grooved end offset axially from one another, said groove end of said pulley having an internal cylindrical wall spaced from the shaft and defining therewith an annular cavity opening axially to the end of the pulley;

a bearing supported on the supporting structure and externally journalling said pulley hub to thereby effect support of said pulley on the supporting structure;

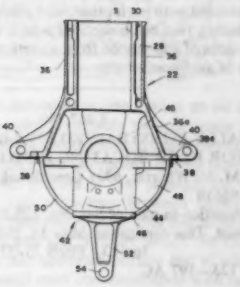
a layer of elastomer material in the annular cavity between the shaft and groove end of the pulley and means connecting the layer of elastomer material to the shaft and pulley comprising a pair of concentric inner and outer rings seated in the cavity and having the layer of elastomer material sandwiched therebetween and bonded thereto and with the outer of said rings being fixed to the pulley and the inner of said rings being fixed to the shaft to thereby affect rotation of the pulley in response to rotation of the shaft and for mounting the shaft end of the engine on said supporting structure through the elastomer layer.

4,467,754

AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Yoshimasa Hayashi, Kamakura; Yoshikazu Hayakawa, Yokosuka, and Naoki Ogawa, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 7, 1981, Ser. No. 327,968
Claims priority, application Japan, Dec. 11, 1980, 55-175083
Int. Cl.³ F02F 7/00
U.S. Cl. 123—195 H **9 Claims**



1. An internal combustion engine for an automotive vehicle having a transmission with a bell housing connected to said engine, said bell housing having a peripheral section which defines a bell mouth, said engine comprising:

a cylinder block having a bottom section comprising a plurality of main bearing supports;

a bearing beam structure secured to the bottom section of said cylinder block and including a plurality of main bearing caps which cooperate with said plurality of main bearing supports, and a beam section for securely connecting said main bearing caps together; and

a support arm projecting from an end portion of said bearing beam structure closest to the transmission, and extending downwardly relative to said cylinder block, said support arm being rigidly connected only to a lower section of said bell mouth which is spaced from said cylinder block and only below a plane through which said beam section extends.

4,467,755

INTERNAL COMBUSTION ENGINE WITH BEARING BEAM STRUCTURE

Yoshimasa Hayashi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 5, 1982, Ser. No. 375,009
Claims priority, application Japan, May 6, 1981, 56-65506[U]
Int. Cl.³ F02F 7/00
U.S. Cl. 123—195 H **8 Claims**

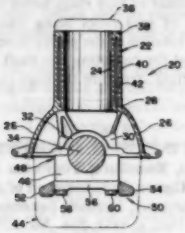
1. An internal combustion engine comprising:

a cylinder block including cylinder barrels, and main bearing bulkheads each having a bearing section for a crankshaft;

main bearing cap sections respectively secured to said bear-

ing bulkheads so that each main bearing cap section and the corresponding cylinder block bearing section associate to constitute a main bearing for rotatably supporting said crankshaft; and

a bearing beam structure detachably secured to said main bearing cap sections to connect said main bearing cap sections with each other as a single unit, said bearing beam



structure including a plurality of beam sections which are disposed parallel to each other and extend along a row of said main bearing cap sections, said beam sections being connected with each other, said plurality of beam sections including two beam sections which are located on opposite sides of and spaced from a vertical plane containing an axis of said crankshaft.

4,467,756

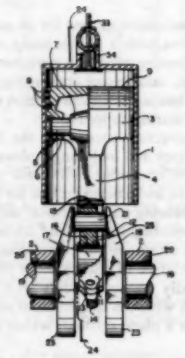
PARTIALLY CONSTRAINED FIVE-BAR MECHANISM FOR RECIPROCATING PISTON ENGINES

Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Continuation-in-part of Ser. No. 120,381, Feb. 11, 1980, abandoned. This application May 11, 1981, Ser. No. 262,038

Int. Cl.³ F02B *75/32*

U.S. Cl. 123—197 AC **11 Claims**



1. A reciprocating piston mechanism comprising a cylinder, a piston reciprocally mounted in said cylinder, a connecting rod comprising a small journal and a major journal, said small journal pivotally mounted in said piston said major journal being rotatively mounted on a transfer disc, said transfer disc comprising a journal housing, a slot positioned to one side of said journal housing, said slot having a top end and a bottom end, a crankshaft comprising crankarms, a primary crankpin fixedly attached to said crankarms, a secondary crankpin having its axial center parallel to that of the said primary crankpin and being also fixedly attached to said crankarms, mainshafts fixedly attached to said crank arms and rotatevely mounted in a block, said journal housing of said transfer disc being rotatively mounted on the said primary crankpin of said crankshaft, the said slot of said transfer disc slidably holding the said secondary crankpin such that the said secondary crankpin contacts the said top end of said slot during the power stroke of said piston and alternately contacts the said bottom end of said slot during the intake, compression and exhaust stroke of said piston.

4,467,757

INJECTOR SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

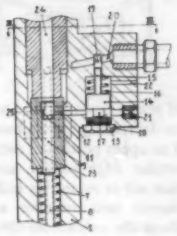
Jean-Louis Dazzi, Bellevue, France, assignor to Renault Vehicules Industriels, Rhone, France

Filed Mar. 23, 1982, Ser. No. 361,014

Claims priority, application France, Mar. 26, 1981, 81 06572

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—198 DB **19 Claims**



1. A fluid injector comprising:

an injector main body;

an injection cavity in said injector main body;

a fluid supply passage having one end interconnected with said injection cavity and having another end interconnectable with a fluid supply means continuously supplying pressurized fluid thereto;

at least one aperture in said injector main body opening into said injection cavity;

selectively movable primary valve means interposed said injection cavity and said at least one aperture and movable between an open position and a closed position;

first biasing means continuously biasing said selectively movable primary valve means in said closed position;

second biasing means selectively actuable to bias said selectively movable primary valve means in said open position, said second biasing means being interconnectable with means for intermittently activating said second biasing means; and

selectively operable deactivating means for said second biasing means, said deactivating means being automatically operable to deactivate said second biasing means when said selectively movable primary valve means remains continuously open for a period of time in excess of a predetermined period of time.

4,467,758

SPLIT ENGINE

Makoto Ueno, Shizuoka, and Kohei Hori, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 15, 1983, Ser. No. 475,622

Claims priority, application Japan, Oct. 22, 1982, 57-184431

Int. Cl.³ F02D *17/02*

U.S. Cl. 123—198 F **17 Claims**

1. A split engine having a plurality of cylinders which are divided into a first cylinder group and a second cylinder group, said engine comprising:

a first intake passage having an inlet and an outlet connected to said first cylinder group;

a second intake passage having an inlet and an outlet connected to said second cylinder group, the inlet of said first intake passage being connected to said second intake passage and the inlet of said second intake passage being open to the outside air;

an exhaust passage connected to said first cylinder group;

a manually operated throttle valve arranged in the inlet of said second intake passage;

an exhaust-gas recirculation passage interconnecting said exhaust passage to said first intake passage;

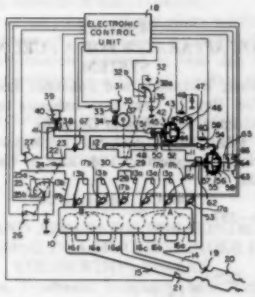
a recirculation control valve, arranged in said exhaust-gas recirculation passage, for controlling the flow area of said exhaust-gas recirculation passage;

first detecting means for detecting the level of the load of the engine and for producing an output signal representing the level of the load of the engine;

second detecting means for detecting the opening speed of said throttle valve and producing an output signal representing the opening speed of said throttle valve;

third detecting means for detecting the position of said recirculation control valve and for producing output signals indicating that the closing operation of said recirculation control valve is started and completed;

electronic control means for producing control signals in response to the output signals of said first detecting means, said second detecting means, and said third detecting means;



fuel supply means, actuated in response to a control signal of said electronic control means, for feeding fuel into only said second cylinder group when the level of the load of the engine is lower than a predetermined level and for feeding fuel into both of said cylinder groups when the level of the load of the engine is higher than the predetermined level;

first actuating means operated in response to a control signal of said electronic control means and opening said recirculation control valve when the level of the load of the engine is lower than the predetermined level;

a shut-off valve, arranged in the inlet of said first intake passage, for controlling the flow area of the inlet of said first intake passage; and

second actuating means operated in response to a control signal of said electronic control means and opening said shut-off valve when the closing operation of said recirculation control valve is completed in the case where the level of the load of the engine becomes higher than the predetermined level, and where the opening speed of said throttle valve is lower than a predetermined first reference speed, said second actuating means opening said shut-off valve when the closing operation of said recirculation control valve is started in the case where the level of the load of the engine becomes higher than the predetermined level, and where the opening speed of said throttle valve is higher than the predetermined first reference speed.

4,467,759

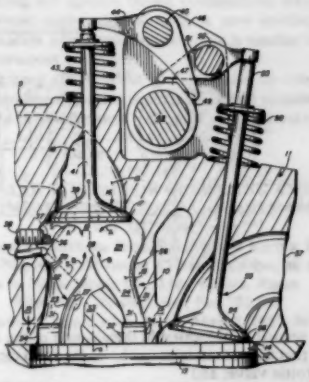
COMBINED AIR INTAKE PASSAGE AND PRECOMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Noel G. Artman, 15830 Nicklaus La., Sun City, Ariz. 85351

Filed Oct. 14, 1982, Ser. No. 434,295

Int. Cl.³ F02B *23/00*

U.S. Cl. 123—263 **21 Claims**



1. In an internal combustion engine having an air inlet passage communicative with a variable volume space within a cylinder of such engine, a precombustion chamber constituting a section of such passage and interposed serially between said space and an upstream portion of said passage, the chamber having a principal axis extending between opposite ends thereof and of which ends one is an air inlet end having a valve seat surrounding said axis and through which the chamber is communicative with said upstream portion and of which ends the other is in juxtaposed open communication with said space, the chamber having a radially inwardly-facing periphery portion surrounding said axis adjacently to said other end of the chamber, and air flow control means disposed captively within the chamber adjacently to said other end thereof and having a dome-like periphery surrounding said axis and spaced radially thereof in opposed outwardly-facing spaced relation with respect to said chamber periphery portion to form therewith an annular transverse sectioned vestibule of the chamber, the base of said dome-like periphery being disposed adjacently to said other end of the chamber, and the opposite end of such dome-like periphery being axially spaced remotely from said other end of the chamber relatively to said base end.

4,467,760

INTERNAL COMBUSTION ENGINE

Yuzuru Namba, and Kenichi Aoyagi, both of Hamamatsu, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jul. 17, 1981, Ser. No. 283,921

Claims priority, application Japan, Jul. 21, 1980, 55-99724; Nov. 8, 1980, 55-157319

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—308 **13 Claims**

2. An internal combustion engine comprising:

A. a carburetor for supplying fuel to a combustion chamber; said carburetor having:

(1) an air path equipped with a venturi; and

(2) a throttle valve capable of being placed in an idling position and in a non-idling position; said throttle valve having a peripheral face; and

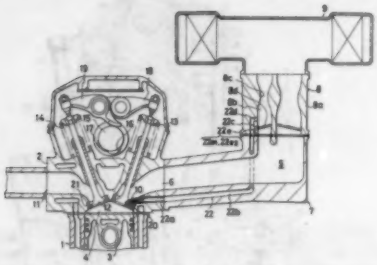
B. a combustion chamber for receiving fuel from the carburetor; and

C. a main suction path connecting the carburetor to the

combustion chamber wherein said main suction path is adapted to be opened and closed by a suction valve; and

D. a sub-suction path separate from the main suction path wherein the sub-suction path has an outlet directed toward the combustion chamber so that a swirl of suction gas is generated in the combustion chamber during a suction stroke; wherein the sub-suction path has at least two inlets, namely:

(1) a first inlet which bypasses the throttle valve of the carburetor and opens into the atmosphere; and



(2) a second inlet located in the air path of the carburetor so that the second inlet can be opened and closed by the throttle valve; and

(3) wherein closing of the second inlet is accomplished by the throttle valve at idling position; and

(4) wherein the second inlet has a wide effective opening area facing the peripheral face of the throttle valve when the throttle valve is at its idling position,

(5) wherein the second inlet constitutes a plurality of openings around the peripheral face of the throttle valve at idling position, thereby enlarging the effective opening area of said second inlet.

4,467,761

ENGINE RPM CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

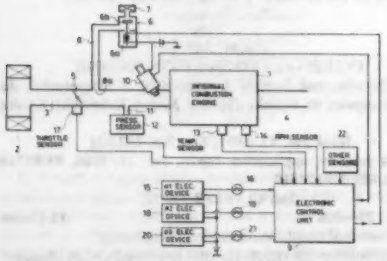
Shumpei Hasegawa, Niiza, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,624

Claims priority, application Japan, Apr. 21, 1982, 57-66928

Int. Cl.³ F02D *11/10*

U.S. Cl. 123—339 **8 Claims**



1. In a method for controlling the idling rpm of an internal combustion engine having an intake passage, a throttle valve arranged in said intake passage, an air passage having one end communicating with said intake passage at a location downstream of said throttle valve and another end communicating with the atmosphere, respectively, and a plurality of electrical devices disposed to apply respective loads on said engine, said supplementary air being supplied to said engine through said air passage and said intake passage wherein the quantity of said supplementary air is controlled in a predetermined manner selected in response to operating conditions of said engine, the improvement comprising the steps of:

setting a plurality of different predetermined quantities of supplementary air to be supplied to said engine, which individually correspond to the magnitudes of electrical loads applied by respective ones of said electrical devices;

detecting the on-off state of each of said electrical devices;

determining whether or not said engine is in a predetermined operating condition wherein said throttle valve is fully closed and the engine rpm is lower than a first predetermined value corresponding to an upper limit of desired idling rpm;

controlling the quantity of supplementary air in a feedback mode manner, as said predetermined manner, responsive to the difference between actual engine rpm and said desired idling rpm, when said engine is determined to be in said predetermined operating condition; and

simultaneously with detection of the on-state of at least one of said electrical devices during said feedback mode controlling step, increasing the quantity of supplementary air by at least one of said different predetermined quantities corresponding to the magnitude of at least one electrical load applied by said at least one electrical device.

4,467,762

CONTROL APPARATUS FOR A FUEL METERING SYSTEM

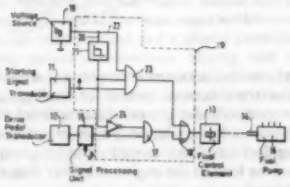
Werner Fischer, Ditzingen, and Johannes Locher, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,447

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134632

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—357 **3 Claims**



1. In a control apparatus of a fuel metering system including a fuel pump having a fuel quantity-determining member, the apparatus including: a source of supply voltage; a drive pedal transducer; a signal processing unit connected to the drive pedal transducer; a starting signal transducer; and a final control element of the fuel quantity-determining member, said final control element having a zero position, the improvement comprising:

control circuit means including means for supply voltage control, said control circuit means being connected to the source of supply voltage, the signal processing unit, the starting signal transducer and the final control element, wherein:

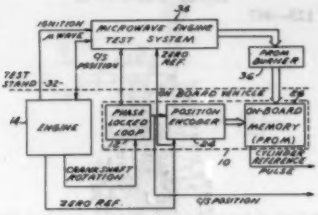
(i) said control circuit means in response to the output of said supply voltage control means brings said final control element into its zero position when the supply voltage is below a predetermined value; and

(ii) said control circuit means subjects said final control element to the supply voltage when a starting signal is generated by said starting signal transducer.

4,467,763
IGNITION TIMING CONTROL FOR INTERNAL COMBUSTION ENGINES

John W. Gilliespie, Chelsea, and Mark L. Haddox, Ann Arbor, both of Mich., assignors to Jodon Engineering Associates, Inc., Ann Arbor, Mich.

Filed Sep. 13, 1982, Ser. No. 416,848
Int. Cl.³ F02P 5/04; G01M 15/00
U.S. Cl. 123—414 13 Claims



1. A method of controlling ignition timing in an internal combusion engine comprising at least one cylinder having a piston disposed to reciprocate therein and an engine crankshaft rotatably coupled to said piston, said method comprising the steps of:

(a) monitoring rotation of said crankshaft,

(b) measuring actual position of said piston within said cylinder as a function of rotation of said crankshaft,

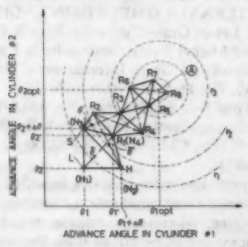
(c) storing information obtained in said step (b) relating actual piston position to crankshaft rotation, and thereafter

(d) initiating ignition at said cylinder as a conjoint function of monitored crankshaft rotation in step (a) and said information stored in said step (c).

4,467,764
METHOD AND APPARATUS FOR CONTROLLING IGNITION TIMING IN A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Yasuhito Takasu, Toyohashi; Toshiharu Iwata, Aichi, and Katsuharu Hosoe, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 6, 1983, Ser. No. 482,706
Claims priority, application Japan, Apr. 7, 1982, 57-58900
Int. Cl.³ F02P 5/04; F02D 5/00, 1/04
U.S. Cl. 123—416 10 Claims



1. A method of controlling ignition timing in a multicylinder internal combustion engine, comprising the steps of:

(a) operating said engine with a plurality of combinations of different ignition timings of respective cylinders to derive engine output data for each combination in such a manner that said engine is operated for a predetermined period with each of said combinations one after another;

(b) further operating said engine with one of said combinations again for a predetermined period to derive further engine output data;

(c) deriving the variation rate of the engine output data obtained under an identical ignition timing combination from the difference between two engine output data values both obtained by engine operation of said steps (a) and (b);

(d) comparing said variation rate with a predetermined value;

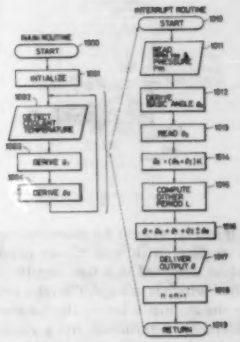
(e) replacing the ignition timing combination, which gives the lowest engine output, with a new ignition timing combination when said variation rate is smaller than said predetermined value; and

(f) determining a subsequent ignition timing by using one of said plurality of ignition timings when said variation rate is equal to or greater than said predetermined value.

4,467,765
METHOD AND SYSTEM FOR OPERATING AN ENGINE AT MAXIMUM TORQUE WITH VARIABLE AMOUNT OF DITHER

Atsushi Suzuki; Masakazu Ninomiya, both of Kariya; Hiroyasu Fukaya, Nagoya, and Susumu Akiyama, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 26, 1981, Ser. No. 352,563
Claims priority, application Japan, Mar. 2, 1981, 56-30148
Int. Cl.³ F02P 5/08
U.S. Cl. 123—419 12 Claims



1. A method of operating an internal combustion engine at optimum output torque under varying operating conditions, said engine having an adjustable engine ignition timing variable, the setting of which controls the output torque, the method comprising:

(a) oscillating the setting of the ignition timing variable on opposite sides of a variable reference setting;

(b) sensing an output variable of said engine during at least three successive phases of the oscillation;

(c) detecting whether the sensed output variable establishes one of first and second sequential relationships of a plurality of possible sequential relationships indicating that said variable reference setting is on one of first and second sides, respectively, of an optimum position;

(d) adjusting said variable reference setting toward said optimum position in resonse to one of said detected first and second sequential relationships;

(e) detecting an engine operating parameter;

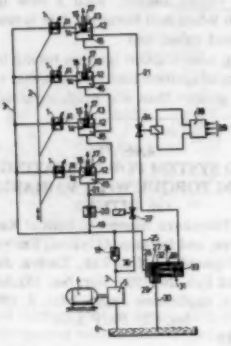
(f) varying at least one of the magnitude of the oscillation, the number of ignitions over which each of said phases occurs and the amount of said adjusting in said step (d) as a function of said detected engine operating parameter; and

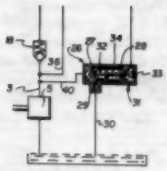
(g) repeating said steps (a) through (f).

4,467,766
FUEL INJECTION SYSTEM

Michael Wissmann, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 236,384, Feb. 20, 1981, Pat. No. 4,408,587.
This application Jun. 1, 1983, Ser. No. 500,047
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1980, 3006258
Int. Cl.³ F02M 39/00
U.S. Cl. 123—454 1 Claim



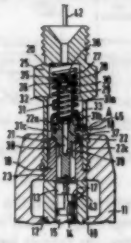


1. A fuel injection system for mixture-compressing internal combustion engines with external-supplied ignition having metering valves disposed in a fuel supply line for metering a quantity of fuel which is in a specific ratio to the quantity of air aspirated by the engine, wherein the metering is effected at a pressure difference determined by a regulating valve, said regulating valve having a movable valve element disposed downstream of each of said metering valves and arranged to regulate said pressure difference at each of said metering valves, said movable valve element further arranged to be subjected on the one hand to the fuel pressure downstream of the respective metering valve and a spring and on the other hand to the pressure in a control pressure line, a pressure regulating valve arranged to communicate with said fuel supply line upstream of a pressure-reduction valve, said last named valve disposed in said fuel supply line upstream of said metering valves, said control pressure line communicates with said fuel supply line via at least one control throttle, and at least one electromagnetic valve is provided to influence the pressure in said control pressure line so that at least a portion of said regulating valve closes, and wherein said control pressure line communicates via said control throttle with said fuel supply line downstream of said pressure-reduction valve, further that said regulating valves have control chambers, and wherein said at least one electromagnetic valve comprises a control pressure valve electromagnetically triggerable in accordance with operating characteristics of said engine disposed downstream of said control throttle, and an electromagnetic valve is located in a bypass line around said control throttle and said pressure-reduction valve, said last named valve arranged to open in the presence of specific control signals, in particular those characterizing engine overrunning.

4,467,767
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Günter Kampichler, Mühlacker; Heinz Kuschmierz, Gerlingen, and Bernhard Schenk, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,631
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 8108316[U]; Jan. 26, 1982, 3202405
Int. Cl.³ F02M 59/02
U.S. Cl. 123—467 11 Claims



1. A fuel injection pump for internal combustion engines having a pump housing and a reciprocating pump piston means defining a pump work chamber as well as an equal-pressure relief valve means inserted into the pressure line leading to an injection valve each said means secured in said pump housing by means of a connector fitting, wherein said equal-pressure relief valve comprises an assembly including a valve housing, a housed pressure valve body opening in the supply direction of the fuel counter to the force of a pressure valve spring and a relief valve opening counter to the supply direction of the fuel, said relief valve further including a valve spring supported on said pressure valve body and said housing therefor being embodied as a beaker-shaped filler piece disposed inside said pressure valve spring, said filler piece being mounted on a cylindrical protrusion of said pressure valve body and adapted to contain said relief valve, characterized in that said equal-pressure relief valve is provided with a fastener means for securing at least a portion of said assembly comprising said pressure valve body said filler piece and said relief valve as a unit when said connector fitting is removed.

4,467,768
ELECTRONIC FUEL INJECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Denis M. P. P. Lebas, Grand Couronne; Jean B. G. H. Leprince, Louviers, and Michel Touly, Amfreville la Campagne, all of France, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Feb. 8, 1982, Ser. No. 346,875
Claims priority, application France, Feb. 9, 1981, 81 02486
Int. Cl.³ F02B 3/00, 33/00
U.S. Cl. 123—472 23 Claims

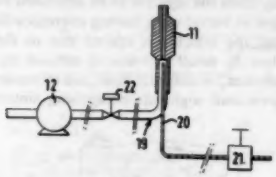
1. An electronic device for injecting liquefied petroleum gas from a fuel reservoir into combustion chambers of an internal combustion engine, wherein the engine includes an air inlet pipe for providing air to be mixed with the liquid petroleum gas for combustion, comprising:

fuel injector means for injecting fuel into the combustion chamber of the engine in response to injection control signals;

control means for forming injection control signals to prescribe the beginning and duration of fuel injection via said injector means, said control means being activated by a first sensing means co-operating with a rotating element driven by the engine and second sensing means for provid-

ing an input signal indicative of the air flow in the air inlet pipe;

fuel-transfer means for providing a continuous circulation of fuel to said injector means from the fuel reservoir, said fuel-transfer means comprising a fuel inlet pipe in fluid communication with said reservoir and said injector means, and a fuel outlet pipe in fluid communication with said inlet pipe and said injector means, said fuel inlet pipe



and said fuel outlet pipe being mounted in heat exchange relation at the back of said injector means and wherein said inlet pipe and said outlet pipe are co-axial and concentric;

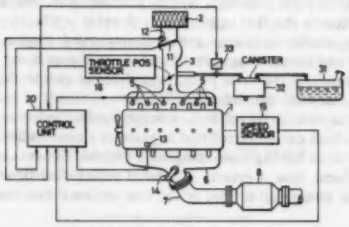
said inlet pipe and said outlet pipe forming a closed fuel-transfer circuit with the reservoir to provide continuous circulation of fuel at the back of each injector, thereby avoiding in-line vaporization of the liquid petroleum gas.

4,467,769

CLOSED LOOP AIR/FUEL RATIO CONTROL OF I.C. ENGINE USING LEARNING DATA UNAFFECTED BY FUEL FROM CANISTER

Toshimi Matsumura, Obu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 7, 1982, Ser. No. 366,388
Claims priority, application Japan, Apr. 7, 1981, 56-52016
Int. Cl.³ F02M *51/00, 25/08*
U.S. Cl. 123—489 **17 Claims**



1. A method for controlling air/fuel ratio in an internal combustion engine equipped with a feedback control system which controls the air/fuel ratio in accordance with an output signal of a gas sensor detecting the concentration of a gas component in the exhaust gasses of said engine, said engine being equipped with an adsorbed fuel vapor supply system which supplies said engine with fuel vapor evaporated in a fuel tank, said method comprising the steps of:

(a) integrating said output signal from said gas sensor for obtaining an integration correcting amount;

(b) detecting the operational condition of said engine;

(c) disabling said adsorbed fuel vapor supply system when said engine is in a predetermined operational condition;

(d) renewing an engine condition correcting amount read out from a memory, in which a plurality of engine condition correcting amounts are prestored, only when said adsorbed fuel supply system is disabled;

(e) storing the renewed engine condition correcting amount in said memory; and

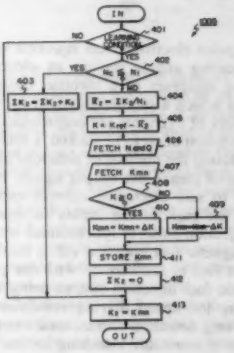
(f) controlling the air/fuel ratio by correcting a standard value, which is obtained on the basis of the operational parameters of said engine, by said integration correcting amount and said engine condition correcting amount.

4,467,770

METHOD AND APPARATUS FOR CONTROLLING THE AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

Takashi Arimura; Hisamitsu Yamazoe, both of Kariya, and Toshimi Matsumura, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 5, 1982, Ser. No. 405,578
Claims priority, application Japan, Aug. 10, 1981, 56-124152
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—489 **8 Claims**



1. A method for controlling the air-fuel ratio in an internal combustion engine comprising the steps of:

detecting the air-fuel ratio in the exhaust gas of said internal combustion engine;

detecting the operating condition of said internal combustion engine;

calculating a value which corresponds to a basic fuel-feeding amount of said internal combustion engine by using said operating condition;

calculating an integration compensation factor which corresponds to the deviation of the actual air-fuel ratio from a desired air-fuel ratio, depending upon said operating condition;

calculating a learning compensation factor depending upon said integration compensation factor and said operation condition;

compensating the calculated value related to the fuel-feeding amount by using said integration compensation factor and said learning compensation factor corresponding to said operating condition;

adjusting the actual fuel-feeding amount by using the compensated value related to the fuel-feeding amount;

repeating the above sequence of steps so as to control the actual air-fuel ratio in said internal combustion engine within a predetermined range;

averaging a predetermined number of said integration compensation factors; and

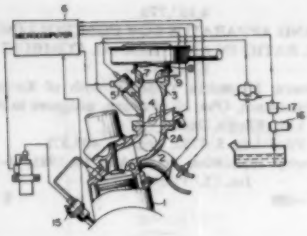
correcting said learning compensation factor in accordance with the average value of the predetermined number of said integration compensation factors.

4,467,771

SINGLE POINT ELECTRONIC FUEL INJECTION SYSTEM

Takeshi Atago, and Toshio Manaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,325
Claims priority, application Japan, Jul. 6, 1981, 56-104485
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—490 **3 Claims**



1. A single point electronic fuel injection system for a four cycle reciprocating engine having an electromagnetic fuel injection valve upstream of a throttle valve provided in a suction path in which a suction manifold is connected and to which a plurality of cylinders are communicated, a sensor for detecting the amount of air to be sucked, a rotational frequency sensor for detecting the number of rotations of the engine, and electronic control means, the output signals from said sensors being applied to said electronic control means, which then calculates on the basis of the inputs an injection pulse and supplies the injection pulse, in synchronism with said engine, to said electromagnetic fuel injection valve, thereby causing said valve to inject fuel in accordance with the pulse, said single point electronic fuel injection system being characterized in that, when any low-speed driving condition is detected by low-speed driving detection means, total amounts of fuel necessary for pairs of consecutive sucking strokes are injected at a time in the first of the paired consecutive sucking strokes and no fuel is injected in the following sucking stroke of the pair by controlling the injection pulse by said electronic control means, and in middle-and high-speed driving conditions, injection pulses are provided in synchronism with each suction stroke.

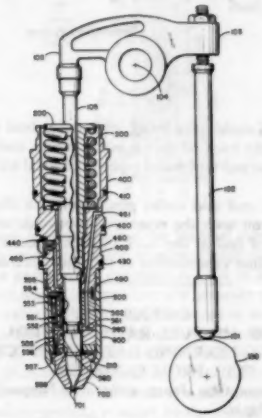
4,467,772

MODULAR BARREL FUEL INJECTION APPARATUS

Charles A. Williamson, 602 Calle de Arboles, Torrance, Calif. 90505

Filed Apr. 13, 1982, Ser. No. 367,903
Int. Cl.³ F02M *59/42*
U.S. Cl. 123—506 **3 Claims**

1. A fuel injector for an internal combustion engine of the type comprising a barrel unit, and nozzle means positioned at one end of said barrel unit in axial alignment therewith, a housing positioned at the other end of said barrel unit in axial alignment therewith; a cover nut removably holding said housing, said barrel unit and said nozzle means in assembled together relationship; means to movably mount a fuel flow control plunger in said assemblage of said housing, said barrel unit and said nozzle means in liquid-tight sliding relationship with said housing, said barrel unit, and said nozzle means; said barrel unit comprising three segments fixed together in axially aligned relationship, fuel supply passageway means and fuel return passageway means formed in said assemblage of said housing, said barrel unit and said nozzle means; said fuel supply passageway means formed in said barrel unit comprising a metering port formed in said barrel unit for cooperation with said plunger; said fuel return passageway means formed in said barrel unit comprising a scavenging port formed in said barrel unit for cooperation with said plunger; said fuel return passageway means formed in said barrel unit comprising a spill port formed in said barrel unit for cooperation with said plunger; said metering, scavenging and spill ports all being of substantially rectangular configuration; at least the portions of said fuel supply and said fuel return passageway means opening into said metering, scavenging and spill ports all being of substantially rectangular configuration; the dimensions of said metering, scavenging and spill ports being such as to permit return fuel flow away from the injector to be increased compared to return fuel flow in barrel units having corresponding circular ports, whereby the injector is cooled due to the increased return fuel flow to result in reduced exhaust emissions, increased horsepower, increased torque, and increased fuel economy; said barrel unit segments comprising sintered powder



metal of controlled porosity, whereby the fuel impregnates the interstices of the metal grains of each segment and whereby self-lubrication of the close sliding fit between said plunger and said barrel unit produces lower friction, less internal heat generation in the fuel injector and thereby produces reduced exhaust smoke emissions and said improved engine performance; and the scavenging port and the spill port being located in substantially the same plane in said barrel unit to thus share substantially the same parting line between two of said three segments of said barrel unit, whereby a fuel injector is provided which can be retrofitted in place of a conventional injector due to its having interchangeable external dimensions while at the same time a greatly increased return fuel flow is provided as compared to that of the conventional injector.

4,467,773

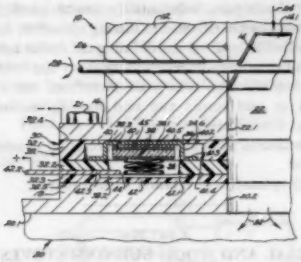
FUEL SUPPLY SYSTEM WITH IMPROVED THROTTLE BODY HEATER

Donald J. Chiavaroli, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 26, 1983, Ser. No. 517,493
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—549 **15 Claims**

1. A fuel supply system for an internal combustion engine comprising throttle body means having passage means open at one end for communicating with a corresponding opening in an intake manifold of the engine to furnish at least the air component of an air-fuel mixture to the engine, the throttle body means having flange means disposed around the open end of the passage means, and gasket means arranged between the throttle body flange means and mating flange means disposed on the engine around the opening in the intake manifold for sealing communication between the passage means and the engine, characterized in that the gasket means provides se-

lected spacing between said flanges and provides compressible sealing means at respective opposite sides of the gasket means to sealingly engage the throttle body flange means and the mating engine flange means, a chamber is provided in the gasket means at a location between portions of the throttle body flange means and said engine flange means, the chamber having an aperture adjacent to the throttle body flange and



electrical resistance heater means are accommodated in the chamber between portions of the throttle body flange means and said engine flange means to engage the throttle body flange means through said aperture and to be energized therein for transferring heat to the throttle body flange means to avoid freeze-up of the throttle body means during furnishing of said component of said air-fuel mixture to the engine.

4,467,774

APPARATUS FOR RECIRCULATING THE EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE

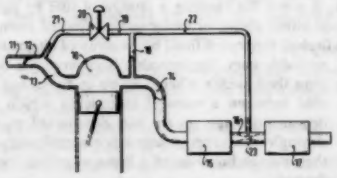
Wolfram Becker, and Hermann Klein, both of Eberdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,136

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235397

Int. Cl.³ F02M *25/06*; F02D *23/00*

U.S. Cl. 123—568 **3 Claims**



1. An apparatus for recirculating the exhaust gas of an internal combustion engine having a line segment leading from the exhaust side to the intake side of the engine in which a valve for controlling the recirculation rate is disposed, the improvement comprising a flushing line connecting a pair of said line segment leading from the exhaust gas side to said valve, to a location point having lower pressure than the pressure in said exhaust side.

4,467,775

METHOD AND APPARATUS FOR CONTROLLING RECIRCULATED QUANTITIES OF EXHAUST GAS IN INTERNAL COMBUSTION ENGINES

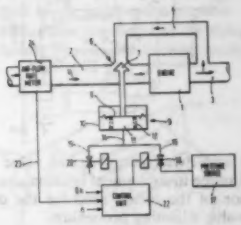
Rainer Buck, Tamm; Thomas Küttner, Stuttgart, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,669

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145527

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—571 **24 Claims**



15. An apparatus for controlling the quantity of exhaust gas recirculated from the exhaust gas system of an internal combustion engine to its intake side, having an air flow rate measuring device disposed in the intake manifold of the engine and a pneumatically functioning adjusting member, the movable part of which is connected with the valve closing member of an exhaust gas recirculation valve and the work chamber of which, enclosed by the movable part, communicates via a valve assembly with pressure sources of various pressure levels, controlled by a control apparatus in accordance with at least the output signal of the air-flow rate measuring device, wherein the control apparatus comprises:

a set-point value generator (**25**) from which a setpoint value formed in accordance with operating parameters for the quantity of air to be aspirated by the engine can be taken; and

a comparison device (**26**), the inputs of which are connected with the set-point value generator and the air flow-rate measuring device and the output of which is connected with the actuation device of the valve assembly.

4,467,776

DWELL PERIOD CONTROL FOR ENGINE IGNITION

Manfred Mezger, Markgröningen; Georg Pfaff, Möglingen, and Karl Seeger, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,348

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129184

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—609 **11 Claims**

1. Method of dwell period control for engine ignition with reference to signals provided by an igntion timing signal generator (**10,11**) comprising the steps of:

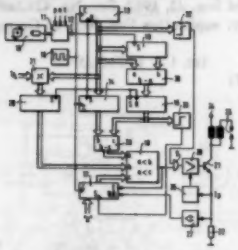
periodically counting out downwards, in a first counter (**14**), an engine-speed-dependent count value in repetitive response to an edge of each of successive signals from said signal generator;

establishing a count value for dwell period start and causing the start of the dwell period in the engine's ignition circuit when said dwell period start count value is reached by said first counter;

adjusting said dwell period start count value with reference to the current flow magnitude in said ignition circuit in the previous dwell period;

raising said dwell period start count value to the the same

predeterminedly fixed high value (A), above the range of count values reachable by the adjusting procedure, whenever engine acceleration exceeds a predetermined acceleration threshold, and



returning said dwell period count value thereafter to the normal range in subsequent ignition cycles by the normal operation of the means used for the dwell period start count value adjusting procedure.

4,467,777

GAS OR ELECTRICALLY HEATED CONVECTION AIR OVEN FOR BAKING FOODS

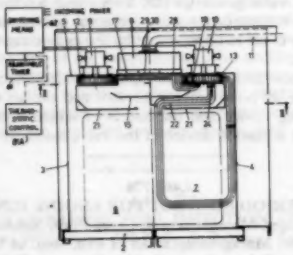
Hans-Rudolf Weber, Rothrist, Switzerland, assignor to Niro Plan AG, Zurich, Switzerland

Continuation-in-part of Ser. No. 282,084, Jul. 10, 1981, abandoned. This application Aug. 12, 1983, Ser. No. 522,511

Claims priority, application Switzerland, Jul. 10, 1980, 5329/80; Jun. 15, 1981, 3920/81

Int. Cl.³ A21B *1/08*

U.S. Cl. 126—21 A **3 Claims**



1. An oven for foods comprising an enclosure having front, rear and side walls, heating means, and blower means whereby air is recirculated past said heating means, said oven being characterized by:

A. said heating means being arranged in said enclosure

(1) adjacent to said rear wall and

(2) substantially symmetrically to a plane midway between said side walls and parallel to them;

B. said blower means comprising

(1) an even number of rotors, all located forwardly adjacent to said rear wall and having rotational axes normal to said rear wall, said rotors being arranged

(a) symmetrically to said plane and

(b) adjacent to said heating means to produce a flow of air thereacross;

(2) motor means for driving each rotor alternately first in one direction of rotation and then in the other, and

(3) housing means for each rotor, each said housing means cooperating with its rotor to cause air propelled thereby to be discharged in a direction away from said plane and to cause such air to be discharged at a higher level when the rotor rotates in said one direction and at a lower level when it rotates in said other direction;

C. substantially vertical baffle wall means in said enclosure,

(1) extending transversely to said plane in front of said heating means and said blower means to divide the interior of the encosure into a rear mixing chamber and a front baking chamber,

(2) said baffle wall means being spaced from said side walls to cooperate with each of them in defining an air inlet that opens substantially unrestrictedly into the baking chamber from the mixing chamber, and

(3) said baffle wall means defining air outlet means opening substantially unrestrictedly from the baking chamber and through which air therefrom can recirculate back to said rotors and said heating means, said air outlet means being

(a) in laterally inwardly spaced relation to said air inlets and

(b) in symmetrical relation to said plane.

4,467,778

COAL AND WOOD BURNING STOVES

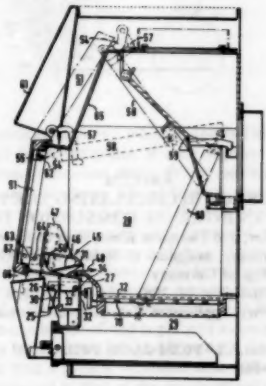
Thomas A. Babbage, Walton-on-Thames, and Frederick W. Cousins, Fetcham, both of England, assignors to Trianco Redfyre Limited, Leatherhead, England

Filed Sep. 23, 1982, Ser. No. 422,100

Claims priority, application United Kingdom, Oct. 5, 1981, 8130064

Int. Cl.³ F24C *1/02*; F23H *7/14, 7/16*

U.S. Cl. 126—77 **11 Claims**



1. A stove for burning a charge of fuel by primary air directed either above or underneath a firebed comprising:

a firebed support defined by an array of alternating fixed and movable bars, the movable bars having a depth greater than their width when viewed endwise and being rotatable between a vertical attitude in which they permit upward passage of air and downward passage of ash through said support and a horizontal attitude in which they permit build-up of a layer of ash at the base of the firebed;

an air distribution chamber having means defining an inlet for primary air, means defining a first outlet from which primary air passes above the firebed and means defining a second outlet from which primary air passes below the firebed;

an air diversion flap that is movable between positions in which air is selectively directed through the first and through the second outlet; and

control means operatively connected to the movable bars and to the air diversion flap to maintain them in an inter-

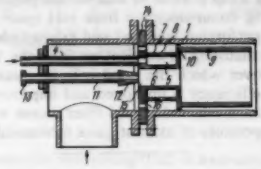
locked relationship so that the stove may be altered between one state in which the movable bars are directed generally horizontally and primary air passes through the first outlet and a second state in which the movable bars are directed generally vertically and primary air passes through the second outlet.

4,467,779

RADIATION TUBE

Efim V. Kreinin, Moscow; Anatoly N. Smolkov; Valentin A. Ilin, both of Gorky, all of U.S.S.R., and Vladimir T. Golykh, deceased, late of Moscow, U.S.S.R. (by Natta T. Ladygina, administrator), assignors to Vsesojuzny Nauchnois-sledovatelsky Institut Ispolzovania Gaza V Narodnom Khozyaistve, U.S.S.R.

Filed Sep. 15, 1982, Ser. No. 418,221
Int. Cl.³ F24C *3/00*
U.S. Cl. 126—91 A **4 Claims**



1. A radiation tube with a multibranch heat-radiating housing having a gas burner disposed therein, the burner comprising

a cylindrical air supply shell having inlet and outlet portions, the shell being arranged axially relative to said heat radiating housing so as to form an annular passageway;

a crossplate arranged at the inlet of said annular passageway, the crossplate having one central and a plurality of circumferential apertures for the passage of air therethrough;

a partition wall interposed between said air supply shell and said heat-radiating housing, said partition wall having a plurality of openings to ensure a uniform distribution of gas therethrough;

an annular gas header defined by said inlet portion of said air supply shell and said partition wall interposed between said air supply shell and said heat-radiating housing.

4,467,780

HIGH EFFICIENCY CLAMSHELL HEAT EXCHANGER

Chester D. Ripka, E. Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 33,588, Apr. 26, 1979, abandoned, which is a continuation of Ser. No. 828,790, Aug. 29, 1977, abandoned. This application May 17, 1982, Ser. No. 378,583
Int. Cl.³ F24H *3/08*
U.S. Cl. 126—110 R **11 Claims**

1. A forced hot air heating furnace for raising the temperature of air being circulated through the furnace including a flue discharge opening which comprises:

an inshot burner for supplying a heating fluid including a combustible mixture of air and fuel;

an induced draft clamshell type heat exchanger adapted to be mounted in various orientations having an internal flow path for the transfer of heat energy from the heating fluid being combusted within the flow path to the air being circulated through the furnace in heat exchange relationship with the heat exchanger and being adapted to the inshot burner for receiving the heating fluid having:

(a) an entry portion located in registration with the burner for receipt of the heating fluid;

(b) a combustion portion connected to the entry portion, the combustion portion gradually increasing in thickness along the flow path to a point and then decreasing in thickness along the flue length and being generally elliptical in cross section and being that portion wherein the fuel is primarily combusted;

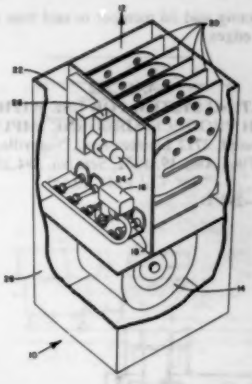
(c) a first curved portion connected to the combustion portion and having a generally elliptical cross section;

(d) a straight portion connected to the first curved portion and substantially parallel with the combustion portion and being generally elliptical in configuration;

(e) a second curved portion connected to the straight portion and being generally elliptical in cross section;

(f) a straight portion connected to the second curved portion being generally rectangular in cross section and being generally parallel to the combustion portion;

(g) a third curved portion connected to the straight portion and being generally rectangular in cross section;



(h) a straight portion being generally rectangular in cross section and being generally parallel with the combustion portion; and

(i) an exit portion connected to the straight portion wherein a continuous flow path is provided for the heating fluid from the entry portion to the exit portion; and

induced draft means mounted adjacent the exit portion of the heat exchanger for forcibly drawing the heating fluid through the flow path of the heat exchanger and for impeding the flow of gases through the flow path when the induced draft means is not being operated including impeding the flow of gases through the flue discharge opening to the flue.

4,467,781

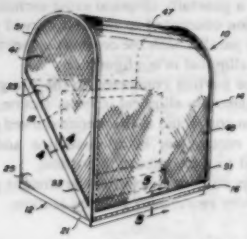
SAFETY APPARATUS FOR PORTABLE FUEL-BURNING HEATERS

Robert H. Campbell, 103 Meadowbrook La., Brookhaven, Pa. 19015

Filed Feb. 22, 1983, Ser. No. 468,641
Int. Cl.³ F24C *15/36*
U.S. Cl. 126—201 **8 Claims**

1. A safety apparatus for use in conjunction with a portable fuel-burning heater, said apparatus comprising a container which completely encloses said heater, said container including a pan-like base member having a rectangular back wall which extends substantially one-half to three-quarters of the height dimension of said container and obliquely-shaped side walls which are downwardly sloped from said back wall towards the front edge of said base member, a vaulted or domed lid member having foraminous front and side wall

portions which conform to and complement the walls of said base member to yield an enclosable receptacle, and hinging



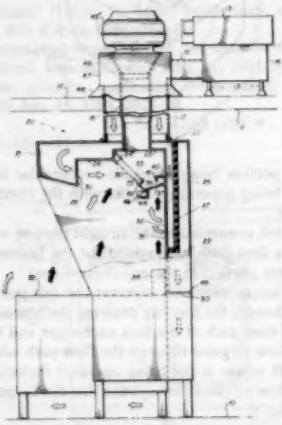
means connecting said lid member to said base member along mating front edges.

4,467,782

VENTILATING SYSTEM FOR USE WITH DEVICES WHICH PRODUCE AIRBORNE IMPURITIES

Robert E. Russell, 2712 Landers Ave., Nashville, Tenn. 37211

Filed Aug. 19, 1981, Ser. No. 294,357
Int. Cl.³ F24C *15/20*
U.S. Cl. 126—299 D **7 Claims**



1. A ventilation system for use with a device which produces airborne impurities, such as a cooking grill, deep fat fryer and the like, the device having a horizontal plane defining a cooking area directly below which the grill, fryer or the like is disposed, the system comprising,

a hood which is to be disposed over the device which produces airborne impurities;

first blower means for supplying untempered makeup air;

first plenum means, including a first perforated wall having a plurality of openings therein, in communication with said first blower means and defining a first makeup air chamber for discharging untempered air into space beneath an upper front portion of said hood;

second plenum means, including a second perforated vertical wall substantially perpendicular to the horizontal cooking area having a plurality of apertures therein, in communication with said first blower means and defining a second makeup air chamber for discharging untempered air into space beneath a back portion of said hood, and to cool air and impurities moving upwardly in an open space adjacent said second perforated wall, said apertures being positioned to discharge air substantially horizontally in the open space adjacent said second perforated wall and parallel the cooking area, said vertical wall and its associated said apertures discharges air into a free space directly above the cooking grill, deep fat fryer or the like which air is unimpeded or diverted by contact with any other surface so as to provide a mass of relatively slow moving air which reduces the temperature of the gases and impurities substantially;

second blower means for exhausting air and impurities from said hood;

an exhaust plenum in communication with said second blower means;

filter means positioned opposite said first perforated wall between same and said exhaust plenum for filtering air being drawn out of said hood; and

further comprising means including a member having at least one opening therein adjacent said filter means and forming at least a portion of a wall of said exhaust plenum, adjacent a top portion of said second perforated wall for providing communication from said space adjacent said second perforated wall and said exhaust plenum;

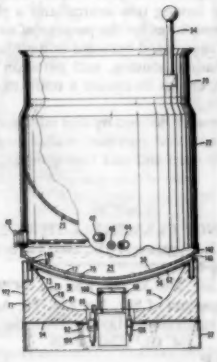
wherein exhausting of ambient air from the vicinity of the device over which the hood is to be placed is reduced, energy efficiency is improved and improved trapping of impurities is effected in said filter means while reducing the temperature of exhaust gases substantially.

4,467,783

RADIANT/JET IMPINGEMENT GAS-FIRED COOKING KETTLE

James R. Hurley, Weymouth, and Joseph R. Birkner, West Peabody, both of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Feb. 4, 1983, Ser. No. 463,782
Int. Cl.³ A47J *27/06*
U.S. Cl. 126—378 **13 Claims**



1. In a cooking utensil including a kettle for holding products to be heated and a jacket enclosing at least a lower wall portion of said kettle, said jacket having a side wall and a bottom wall which together with said lower wall portion of said kettle form a cavity for retention of a vaporizable fluid, the combination therewith of a heat transfer system comprising:

a jet plate mounted below the bottom wall of said jacket and having a multiplicity of openings therethrough, the upper surface of said plate being substantially parallel to the bottom wall of said jacket to form a substantially uniform jet gap there between;

a combustion housing mounted below said jet plate and defining with said plate a combustion chamber, said housing including a side wall, a bottom wall facing said plate, and an upper wall portion sealably supporting said plate near the periphery thereof;

burner means for directing hot gases into said combustion chamber and against the lower surface of said plate to heat said plate to radiance and to produce jets of hot gases which flow at high velocity into said jet gap from said openings and impinge on said bottom wall; and

exhaust means for removing said hot gases from said jet gap.

4,467,784

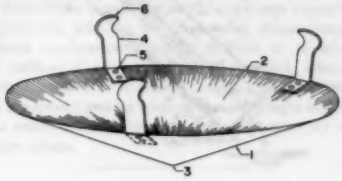
BOIL-OVER PREVENTER

Helena M. Lee, and Robert K. Lee, both of 1312 Parsnip Crescent, Prince George, British Columbia, Canada V2M 4C4

Filed Mar. 7, 1983, Ser. No. 472,569

Int. Cl.³ A47T *27/58*

U.S. Cl. 126—384 **1 Claim**



1. An apparatus for restraining fluid in a standard saucepan, provided with a standard saucepan lid, from boiling over the top edge of said saucepan, comprising:

(a) a hollow cone-like means for directing all rising froth bubbles in the saucepan to the sides of the saucepan and then breaking said bubbles below the top edge of the saucepan and returning all resultant fluid to the bottom of the saucepan, said cone fitting entirely within said saucepan, the outermost edges of said cone fitting in close tolerance to the inside walls of the saucepan, said cone having an open base and and open vertex, the opening in the vertex of said cone being at most one centimeter in diameter;

(b) at least two elongated springclip-like means for suspending said cone totally inside the saucepan from the saucepan lid and maintaining said cone in an inverted position within the saucepan while permitting the saucepan lid to seat directly upon the saucepan, said elongated springclips each having one end permanently attached to the base of said cone; and

(c) means for engaging said springclips with the inner curvature of said standard saucepan lid, said engaging means being located at the distal ends of said springclips.

4,467,785

CHEMICAL HEAT STORAGE

Cooper A. Langford, 120 Ossington St., Ottawa, Ontario, Canada; John Jones, 16 St. Andrews Cir., Kanata, Ontairo, Canada, and William D. Riddell, P.O. Box 92, Munster, Ontario, Canada

Filed Dec. 1, 1980, Ser. No. 211,808

Int. Cl.³ F24H *7/00*; B01D *53/00*; F25D *17/06*; F28D *1/00*

U.S. Cl. 126—400 **33 Claims**

1. A dessicant heat storage system comprising:

(a) a source of air;

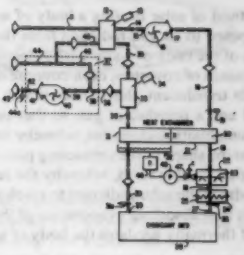
(b) a fan means for circulating said air in a circulation system including an outgoing loop and a return loop for circulating air;

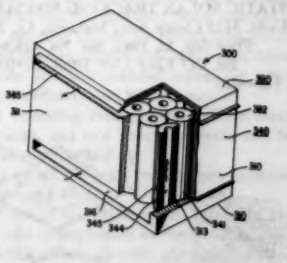
(c) selectively operable evaporator heat exchanger means disposed in the outgoing loop of said circulating air;

(d) selectively operable air wetting means disposed in the outgoing loop of said circulating air;

(e) selectively operable air heating means disposed in the outgoing loop of said circulating air;

(f) a dessicant-material-containing enclosure used to provide heat storage disposed in said circulation system, said enclosure consisting essentially of (i) a rectangular box; (ii) a bottom intake plenum; (iii) an upper outflow plenum; (iv) a plurality of hollow tubes, each comprising an outer mesh shell, an inner mesh shell, a free inner core and dessicant material filling the annular cylinder between the inner shell and the outer shell; (v) a tubular inlet collar projecting into the core of each said hollow tube, for feeding air from said bottom intake plenum to said hollow tubes; (vi) a tubular outlet tubular collar projecting into the core of each said hollow tube for feeding air from said hollow tubes to said upper outflow plenum; (vii) means for feeding air to said bottom intake plenum; (viii) means for withdrawing air from said upper outflow plenum; (ix) air inlet means to said bottom intake plenum from the outgoing loop of said circulating air; and (x) air outlet means from said upper outflow plenum to the return loop of said circulating air; whereby air entering said bottom intake





plenum passes to said upper outflow plenum by a primary flow path out of contact with a major amount of said dessicant material directly through the free inner core of the hollow tube into which it is directly fed by an associated tubular inlet collar and by a secondary permeating flow path in contact with said dessicant material through at least one annular, cylindrical, dessicant-filled tube to a free core into which it had not been directly fed by an associated tubular collar;

(g) selectively operable condenser heat exchanger means disposed in the return loop of said circulating air; and

(h) selectively operable air control means disposed in the return loop of said circulating air, for selectively: (i) circulating said air through a primary heat distribution system; or (ii) recirculating said air through said circulating system.

4,467,786

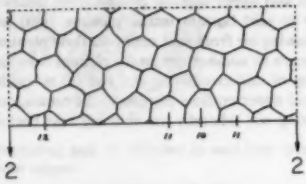
SOLAR HEATING OF WATER UTILIZING COVERITES

Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Soren Christian Sorensen, Rancho Santa Fe, Calif.

Continuation-in-part of Ser. No. 320,484, Nov. 12, 1981, abandoned. This application Mar. 2, 1983, Ser. No. 469,562

Int. Cl.³ F24J 3/02

U.S. Cl. 126—415 20 Claims



1. A method of solar heating a body of water which has its surface exposed to air and radiation from the sun, by covering the surface of the body of water with a floating blanket consisting of thousands of coverites; each coverite comprises a wall of thin flexible translucent plastic film, which encases a translucent liquid and a translucent gas, so that each coverite compresses its neighboring coverites, whereby its thin flexible wall conforms to the shape of the contacting part of the neighboring coverites' thin flexible walls, whereby the resulting blanket of coverites admits the solar radiation to reach the body of water, and reduces heat absorbing evaporation of the body of water to the air, and thermally insulates the body of water from the air.

4,467,787

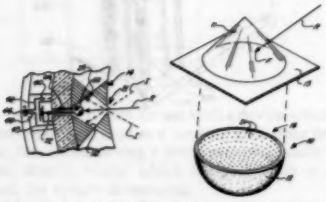
STATIC SOLAR TRACKING MECHANISM

Naoaki Ueda, 3113 Cleary Ave., Metairie, La. 70002

Filed Sep. 13, 1982, Ser. No. 416,860

Int. Cl.³ F24J 3/02; H05G 21/00

U.S. Cl. 126—425 5 Claims



1. A solar tracking mechanism comprising:

a. a semispherical collector body having an inner concave surface with a center focal point;

b. a plurality of solar collection modules mounted within the body on the concave surface in a matrix with each of the modules having a passageway that communicates with the concave surface, each passageway aligning with a radius of the concave surface center focal point;

c. a strip of thermally expandable material mounted within the passageway;

d. switch means associated with the thermal strip and positioned adjacent thereto so that expansion and contraction of the thermally expandable strip actuates the switch responsively between on and off positions.

4,467,788

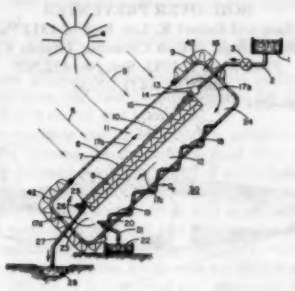
SOLAR ENERGY ACTUATED APPARATUS FOR DISTILLING WATER FROM LIQUIDS AND SOLIDS

Anthony Peranio, 48 E. Erie St., Blauvelt, N.Y. 10913

Filed Dec. 14, 1982, Ser. No. 435,906

Int. Cl.³ F24J 3/02

U.S. Cl. 126—433 1 Claim



1. An improved solar energy actuated apparatus for distilling water from liquids and solids comprising in combination: A box-like enclosure with a window transparent to most of the solar energy permitted to irradiate it mounted in an open face of this enclosure; an internal partition member mounted substantially parallel with the plane of the window apparatus, placed below said window, and so placed as to divide the internal space of the box of the apparatus of the invention into two substantially equal interconnected volumes, which interconnection is afforded by allowing substantially equal spaces between the partition of the apparatus, at each of its ends, and the walls of the box of the apparatus; a solar energy collector plate, essentially the same size in area as the partition of the apparatus mounted and joined to said partition on the partition's upper face, facing and parallel with the plane of the window of the apparatus; a thickness of thermal insulation covering the lower face of the partition of the apparatus in its entirety, which combination of collector plate, partition, and thermal insulation form a physical barrier which divides the internal volume of the box of the apparatus of the invention into two interconnected parts designated as the evaporating section (upper part) and condensing section (lower part); condenser means for conveying heat out of the condenser section of the box mounted in the lower or shaded wall of the box of the invention; means for introducing liquids and/or solids into the evaporating section of the box of the apparatus of the invention so that they are exposed to the hot air and the solar radiation contained therein; means for removing the spent liquids and/or solids from the evaporating section after distillation of water from them; and means for collecting and removing from the condensing section of the box of the apparatus of the invention the distilled water that is formed and collects there, it being understood that the geometry of the apparatus of the invention, and its orientation with respect to incident solar radiation is such as to encourage satisfactory continuous thermal convective circulation of the air and water vapor mixtures formed in the apparatus. wherein the means for introducing the liquids into the evaporating section of the apparatus comprises a supply pipe carrying the liquid from which water is to be distilled connected into a manifold mounted over the upper edge of the collector plate of the apparatus of the invention, which manifold is provided with discharge means to make the liquid flow over the collector plate, so that all the streams or large droplets formed during the discharge of the liquid from the discharge means will flow, under the action of gravity, downward over the heat surface of the collector plate in order that evaporation of water contained in the liquid will be encouraged, wherein the means for introducing solid pro-

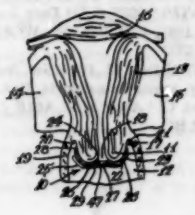
duce into the evaporating section of the apparatus, and removing it therefrom after sufficient water has been distilled from it, is by way of an opening in the box of the apparatus, covered by a suitable cover during operation of the apparatus, and opened only during the required loading and unloading operations of the produce to be dried; which apparatus for drying solid produce is provided with substantially open racks mounted over the collector plate of the apparatus, and distributed over said face so that the produce being dried will be held by such racks during the drying out operation and will be exposed to the solar energy and to the hot air circulating through the evaporating section; which produce to be dried is loaded into the evaporating section and onto the racks therein in a quantity which does not substantially impede or prevent the required thermal convective circulation of air and water vapor mixture of the apparatus, wherein the condensing means comprises a folded plate condenser cooled by ambient air to which the external surface of said condenser is exposed, wherein the folded plate condenser is cooled both by the ambient air to which it is exposed and by cooling water brought into contact with the outer folded plates of said condenser by suitable application means.

4,467,789

CUSTOM VALVED CERVICAL CAP

Robert A. Goepp, Chicago, and Uwe E. Freese, Oak Park, both of Ill., assignors to University Patents, Inc., Norwalk, Conn.

Division of Ser. No. 108,319, Dec. 31, 1979, Pat. No. 4,322,463.
This application Oct. 13, 1981, Ser. No. 310,493
Int. Cl.³ A61B *19/00*; A61F *5/46*
U.S. Cl. 128—1 R **10 Claims**



1. A method for making a removable cap for cervix uteri which comprises the steps of:

contacting a substantially undistorted exocervical surface of said cervix uteri with a physiologically tolerable, hardenable paste for a time period sufficient to harden the paste and produce an impression of said exocervical surface;

introducing a plaster of paris slurry into the produced impression and setting said slurry to form a substantial replica of said exocervical surface;

removing said replica from said impression;

positioning a sheet of thermoplastic elastomeric material over said replica;

positioning a protective film over said thermoplastic sheet material;

applying heat to the positioned sheet in an amount sufficient to soften the sheet;

pressing the softened sheet against the replica to deform and conform the softened sheet to the surface of the replica contiguous therewith;

cooling the pressed sheet to produce a cup-shaped elastomeric shell having a convex outer surface and a concave inner surface that is substantially complementary with that portion of said exocervical surface which defines the surface of the portio vaginalis cervicis; and

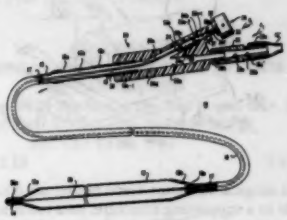
trimming the produced cup-shaped elastomeric shell to a desired size.

4,467,790

PERCUTANEOUS BALLOON

Peter Schiff, Rte. 7, Cookeville, Tenn. 38501

Division of Ser. No. 253,680, Apr. 13, 1981, Pat. No. 4,422,447.
This application Jun. 6, 1983, Ser. No. 501,405
Int. Cl.³ A61B *19/00*; A61M *25/00*
U.S. Cl. 128—1 D **3 Claims**



1. An intra-aortic balloon assembly comprising:

an elongated intra-aortic balloon means having a distal end terminating in a tip and a proximal end;

said balloon means being formed of a material which is substantially inelastic to substantially prevent elastic expansion during normal inflation;

coupling means having a through-bore for communicating pulsatile pressure to said balloon means;

elongated catheter means coupled between the proximal end of said balloon means and one end of said through-bore;

the other end of said through-bore being adapted for coupling to a pulsatile source for introducing positive and negative gas pressure into said balloon means through said through-bore and said catheter means for periodically inflating and deflating said balloon means;

stylet means extending through said balloon means, said catheter means, and said coupling means and having a distal end coupled to said tip;

said coupling means having a branch-bore communicating with said through-bore;

the proximal end of said stylet means extending through a portion of said through-bore and into said branch bore;

a manual operating knob assembly arranged external to said coupling means for rotating said stylet means and including control knob coupled to rotatable threaded operating member;

said coupling means branch bore having a tapped interior portion engageable with said threaded operating member for rotatably supporting said manual operating knob assembly to permit rotation of said manual operating knob assembly in first and second opposite directions to rotate said stylet means and thereby selectively twist and untwist said balloon means; and

a first stop comprising a shoulder in said branch bore engageable with a shoulder on said threaded operating member for limiting rotation of said manual operating knob assembly in a first direction and second stop means comprising the end of said control knob engaging the adjacent end of said coupling member to limit rotation in a second direction to thereby limit the twisting and untwisting respectively of said balloon means to a predetermined amount.

4,467,791

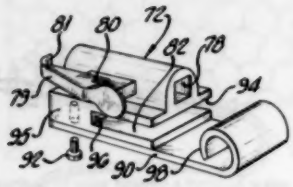
SURGICAL RETRACTOR HOLDER

Rene J. Cabrera, Brockton; George W. Guay, North Scituate, both of Mass., and John R. Bookwalter, Brattleboro, Vt., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Continuation of Ser. No. 286,908, Jul. 27, 1981, Pat. No. 4,421,108. This application Jun. 27, 1983, Ser. No. 507,821

Int. Cl.³ A61B *17/02*

U.S. Cl. 128—20 **1 Claim**



1. In a surgical retractor blade holder for attaching a retractor blade to a supporting structure, said retractor blade having a retractor blade handle, said retractor blade holder having:

a body section having a bottom surface and including means for holding said retractor blade handle;

an open slot in said body section for engaging a supporting structure, said slot having an inside surface and a top and a bottom surface, none of said slot surfaces interacting with said retractor blade handle;

the improvement comprising:

a spring detent extending from said body section bottom surface, generally parallel to said bottom surface of said slot in said body section and having a free end extending beyond the open end of said slot;

the free end of said spring detent including a raised portion and providing a confronting surface aligned with said open end of said slot, the top of said raised portion extending above the top surface of said slot but not obstructing access of said retractor blade handle to said means for holding said retractor blade handle;

the confronting surface of said raised portion spaced apart from the inside surface of said slot a distance at least equal to the width of said supporting structure but less than the combined distance of the depth of said slot and the width of said supporting structure;

whereby said retractor blade holder may be placed on said supporting structure by displacing said spring detent and sliding into said slot a first side of said supporting structure until said spring detent springs back into position on the opposite side of the supporting structure to hold said holder on said supporting structure even when said retractor is in the relaxed position.

4,467,792

FRACTURE CAST BRACES

David E. Young, Watlington, and David H. Boyes, Liverpool, both of England, assignors to Protectair Limited, Watlington, England

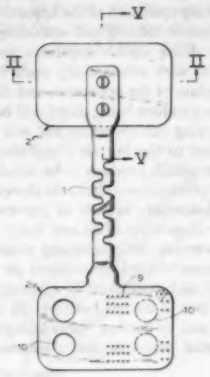
Filed Jan. 17, 1983, Ser. No. 458,178

Claims priority, application United Kingdom, Nov. 18, 1982, 8232996

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—88 **31 Claims**

1. A head plate adapted to bond to casting material for use in conjunction with a flexible hinge part having a connecting portion to form a hinge brace for a fracture cast, the head plate comprising a body with upper and lower surfaces, said body comprising a central portion with a recess of substantially the same dimensions as the hinge part connecting portion, said recess opening on one of said upper and lower surfaces, being adapted to receive the connecting portion therein with the exposed surface of the connecting portion substantially coplanar with said body surface and forming therewith a substantially continuous, uninterrupted bonding surface in said central portion of said body.



4,467,793

INSTRUMENTARIUM FOR REDUCING AND FIXING OF PERTROCHANTEROUS AND SUBTROCHANTEROUS FRACTURES AS WELL AS INSERT MEMBER FORMING PART OF THIS INSTRUMENTARIUM

Hans G. Ender, Ferstelgasse 6/20, A-1090 Vienna, Austria

PCT No. PCT/AT80/00035, § 371 Date Jan. 12, 1981, § 102(e) Date Jan. 12, 1981, PCT Pub. No. WO81/01647, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 12, 1980, Ser. No. 224,044

Claims priority, application Austria, Dec. 14, 1979, 7896/79

Int. Cl.³ A61F *5/04*; A61B *17/18*

U.S. Cl. 128—92 BC **30 Claims**

1. A device for reducing and fixing pertrochanterous and subtrochanterous fractures, comprising:

at least one resilient bone nail, said at least one bone nail being arcuate at least at its proximal end portion and including a coupling member at its distal end adapted to be rotated by a tool, said at least one bone nail being adapted for insertion into the medullary canal of a bone through an impact hole therein; and

an insert member adapted to be inserted in the impact hole, said insert member having a guiding channel therein adapted to permit passage therethrough of said at least one resilient bone nail and to at least partially accomodate the coupling member, said insert member also integrally in-

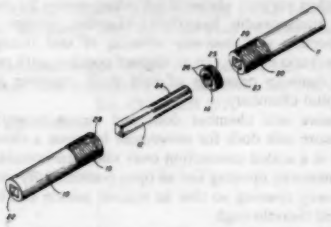
cluding a means adapted to fix said insert member in the impact hole and to prevent it from shifting therein.

4,467,794

INTRAMEDULARY BONE-SETTING ASSEMBLY

Ernest Maffei, 1681 James St., Syracuse, N.Y. 13203, and David W. Patch, Rte. #2, Clarkesville, Ga. 30523

Filed Feb. 8, 1982, Ser. No. 346,580
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 BC 4 Claims



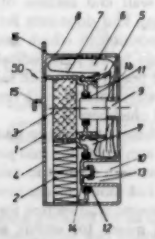
1. A bone-setting assembly for aligning and mutually non-rotatably securing together two portions of a fractured bone, comprising a pair of tubular members adapted to be inserted into the intramedullary bone passages of the respective bone portions at the point of fracture, each tubular member having a substantially cylindrical exterior surface and an interior passage that is polygonal in cross section, means consisting of a knurled or scored surface at one end of each tubular member to secure it in fixed relation in its respective bone portion, the other end of each member having a smooth cylindrical surface, a central connecting and aligning pin adapted to be received with a sliding fit in the hollow interior passages of the tubular members, the pin having a polygonal cross section conforming to that of the tubular member passages whereby relative rotation between the pin and members is prevented, the pin being threaded over approximately one-half of its length while retaining its polygonal cross section in the threaded portion, and a nut threaded on the pin and being operable to move the pin longitudinally in the tubular member passages so that it can be positioned with approximately one-half of its length in each tubular member.

4,467,795

BREATHING DEVICE PACKAGE

Wolfgang Eckstein, Sereetz, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 460,999
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1982, 3206483
Int. Cl.³ A62B 7/00
U.S. Cl. 128—201.25 7 Claims



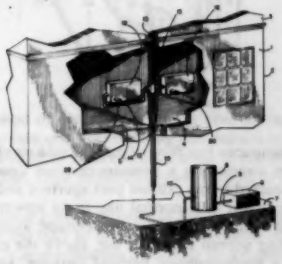
1. A breathing device package suitable for a wall mount, comprising a filter container including mount means for mounting said container on a wall, said filter container having an air intake opening and an inspiration opening therein in side by side relationship, said container defining an air flow passage between said air intake opening and said inspiration opening. a gas filter mounted in said air flow passage adjacent said inspiration opening, a suspended matter filter mounted in said air flow passage adjacent said air intake opening, a breathing mask mounted on said filter container around said inspiration opening, a cover removably mounted onto said filter container and enclosing said breathing mask and said air intake opening, and plug means associated with said cover for closing at least one of said inspiration opening and said intake opening when said cover is engaged over said filter container.

4,467,796

EMERGENCY BREATHING AIR SUPPLY SYSTEM AND APPARATUS

Arthur E. Beagley, 5920 Boulder Hwy., Las Vegas, Nev. 89122

Filed Dec. 2, 1981, Ser. No. 326,562
Int. Cl.³ A62B 7/00
U.S. Cl. 128—202.13 5 Claims



1. Apparatus for providing a flow a breathable air to the nose and mouth area of a user in an emergency which comprises

a housing having a front panel,

an air supply chamber in said housing,

first conduit means for supplying air to said chamber,

first valve means for controlling flow of air through the first conduit means to said chamber,

a plurality of face-engaging means for distributing air from the chamber to the nose and mouth area of a user's face, and second conduit means for conducting air from the air supply chamber to each of said face engaging means, and

a plurality of open ended cylindrical storage means each having one end mounted through said front panel and an opposite end extending into said housing; said second conduit means comprising compressible flexible tubing slidably mounted in said cylindrical storage means and having first and second ends, said first end connected to said face engaging means and said second end permanently attached to the opposite end of said cylindrical storage means, passageway means fluidically communicating the opposite end of said storage means with said air chamber to permit flow of air from the air chamber into the flexible tubing, whereby said flexible tubing is extendable between a compressed stored position within the housing and an operating position extending from said housing.

4,467,797

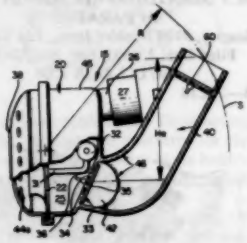
BREATHING EFFORT REDUCTION DEVICE FOR SCUBA GEAR

David M. Franke, 714 Keyes, Menasha, Wis. 54952

Filed Dec. 15, 1980, Ser. No. 216,663
Int. Cl.³ A62B 7/04
U.S. Cl. 128—204.26 15 Claims

1. An improved underwater breathing demand regulator

device, comprising, in combination, a housing having, in normal use, a top portion and a bottom portion, the regulator device having a mouthpiece extending from the housing top portion and an exhaust port aperture defined in the housing bottom portion, a one-way exhaust valve communicating with the exhaust port, a valve reactor diaphragm in the housing located apart from the one-way exhaust valve, and being adapted to separate space inside the housing into an air chamber and a water chamber, an air inlet valve responsive to movement of the diaphragm for admitting pressurized air to the air chamber for flow to the mouthpiece, biasing means providing a predetermined biasing force on said inlet valve to urge said inlet valve into a closed configuration at any given level below the water surface, whereby a counteracting force on said diaphragm slightly greater than said predetermined biasing force on said inlet valve is required to open said inlet valve and



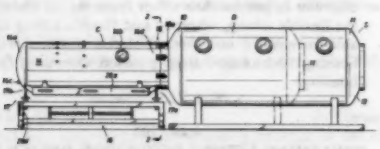
provide a continuous free flow of gas into said air chamber, the improvement comprising a pressure-resistant conduit means directly connected to the exhaust port aperture and extending, when the regulator is in normal use, in an upward direction therefrom to terminate at a conduit exhaust aperture means located, during normal regulator use, above the exhaust port aperture at a predetermined vertical distance, said pressure resistant conduit means providing a continuous and unobstructed flowpath from said exhaust port to said exhaust aperture means, whereby the flow of exhaust air through the air chamber, the exhaust port aperture and up and out of the conduit at the conduit exhaust aperture means acting to create a predetermined siphon-effect suction pressure in the air chamber and a corresponding predetermined negative force on the diaphragm related to the vertical extent of the conduit which is at least slightly less than the positive force on the diaphragm caused by the baising means of the inlet valve.

4,467,798

TRANSPORTABLE HYPERBARIC LIFE SUPPORT CHAMBER

Ross E. Saxon, Spring, and W. Robert Bryant, Houston, both of Tex., assignors to Nautilus Environmentals, Inc., Houston, Tex.

Filed Dec. 14, 1981, Ser. No. 330,339
Int. Cl.³ A61M *16/02*
U.S. Cl. 128—205.26 **10 Claims**



1. A transportable hyperbaric life support chamber, comprising:

a transportable hyperbaric chamber which is generally cylindrical in configuration having a first end, an opposite second end and being of sufficient width and length to receive an injured person, said chamber having a manway opening at said first end being of sufficient diameter to receive an injured person;

chamber interconnection means at said first end of said transportable hyperbaric chamber for temporarily connecting said manway opening of said transportable hyperbaric chamber first to a manway opening of a deck chamber so that an injured person can be transferred from such deck chamber through said manway opening to said transportable hyperbaric chamber and subsequently to a manway opening of a hospital chamber so that such injured person can be transferred out of said transportable hyperbaric chamber to said hospital chamber;

a chamber support platform including means for mounting said transportable hyperbaric chamber thereon and for supporting said manway opening of said transportable hyperbaric chamber in an aligned position with respect to the manway openings of said deck chamber and said hospital chamber;

a pressure safe chamber door and means mounting said pressure safe door for movement between a closed position in a sealed connection over said transportable chamber manway opening and an open position fully out of said manway opening so that an injured person can be transferred therethrough;

a stretcher support assembly mounted in said transportable chamber and extension mounting means for moving said stretcher support assembly from a retracted position in said transportable chamber to an extended position in which said stretcher support assembly extends through said manway opening and into said deck or hospital chamber for transferring a patient when said transportable chamber and deck or hospital chamber are temporarily connected;

said transportable chamber having at said first end a wall end section transversely directed with respect to the longitudinal axis of said transportable chamber and having said manway opening formed therein;

said pressure safe door having a configuration and size larger than said manway opening, a door arm connected to said pressure safe door; and being positioned inside of said chamber and said transverse wall section, said pressure safe door having a peripheral outside surface portion having a sealing member mounted in said surface for sealingly engaging the inside of said transversely directed chamber wall end section with said door in a closed position;

first and second pivot mounting means mounted with said transverse wall end section and with said door and being interrelated to move said door from a closed position in which said door is transversely positioned with respect to the longitudinal axis of said chamber; and is sealed against said chamber transverse wall end section to an open position in which said door is pivoted to a position out of the path through said manway opening with said door being parallelly oriented with respect to the longitudinal axis of said chamber;

said first pivot means being attached to said door arm and to said transverse wall end section of said transportable chamber mounting said door arm for pivotal movement between a first position in which said door arm is positioned transversely to the longitudinal axis of said chamber and a second position in which said door arm is positioned approximately parallel with respect to the longitudinal axis of said chamber;

said second pivot means attached to said pressure safe door and to said door arm mounting said pressure safe door for pivotal movement with respect to said door arm;

a lockable link and link mount means mounting said lockable link on said transverse wall section for pivotal movement;

removable link set means for setting said link in a transversely extending position in which a portion of said link extends into the path of said manway opening, said lockable link being movable to a withdrawn position out of the

path of said manway opening when said link set means is removed;

a matching latch element mounted on said pressure door; and

a lock handle assembly mounted onto said lockable link for pivotal movement with respect to said link, said lock handle assembly including latch means extending longitudinally into said manway opening in said transverse chamber wall section and into locking engagement with said mating latch element mounted on said pressure safe door.

4,467,799

TRANSPARENT ODOR-FREE FACE MASK

Jacob H. Steinberg, 2631 E. West Hwy., Chevy Chase, Md. 20815

Continuation-in-part of Ser. No. 146,439, May 5, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,922

Int. Cl.³ A62B *7/10*

U.S. Cl. 128—206.14 **1 Claim**

1. A dental mask structured to overcome a wearer's reticenes in wearing it which includes a thin, foraminous, transparent, thermoplastic and resinous sheet which has been treated with an aqueous transparent coating of an odor masking coating and an aqueous transparent coating of a bacteriocide which is then perforated while being molded into an inverted C-cup shape having a narrow outwardly flanged border on its periphery which is adapted to fit over the oronasal regions of the wearer's face, said border has applied to its back surface 3 spots of transparent pressure sensitive adhesive enclosed in transparent microballoons of resin to permit thumb pressure so as to apply a minimum of adhesive to attach said mask at 3 points of the face of a wearer, one at the bridge of the nose and one at each of the 2 cheeks of a wearer.

4,467,800

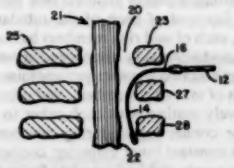
TOOL FOR CREATING A POCKET FOR A EPIDURAL ELECTRODE

Duane J. Zytkovicz, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 16, 1982, Ser. No. 369,291

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—303 R **14 Claims**



1. A tool for creating a pocket for an epidural electrode, said tool having a handle portion and characterized by a curved tongue means extending from said handle, said curve being along the thinner dimension of said tongue and said curve being of sufficient arc that when the distal end of the tongue is placed within the epidural space and substantially parallel to the spinal cord, the proximal portion of the curve extends substantially parallel to the spinal plane a major portion of said tongue being formed of a pliant material having sufficient rigidity to separate epidural fat to form a pocket in the epidural space, but sufficiently pliant to prevent trauma to the dura upon contact.

4,467,801

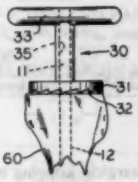
METHOD AND APPARATUS FOR SHAPING A PROXIMAL TIBIAL SURFACE

Leo A. Whiteside, Chesterfield, Mo., assignor to Wright Manufacturing Company, Arlington, Tenn.

Filed Mar. 9, 1983, Ser. No. 473,464

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—303 R **7 Claims**



1. A method of preparing a human tibia having a superior proximal surface and a central long axis defined by the interior of a tubular shaft of hard compact bone to receive a superior proximal tibial knee prosthesis, said method comprising the steps of

(A) resecting a small amount of the superior proximal surface of the tibia to form an approximately planar surface which is approximately transverse to the central long axis of the tibia,

(B) determining the approximate location on the superior proximal surface of the tibia which corresponds to the central long axis of the tibia,

(C) advancing a reamer/alignment guide through said superior proximal surface at said location along the interior of said tubular shaft of the tibia for a sufficient distance to enable the central long axis of said reamer/alignment guide to correspond with the central long axis of the tibia, said reamer/alignment guide comprising a rod having a first portion which is intended to enter the interior of said tubular shaft of the tibia which portion (1) is of an outside diameter approximating the narrowest portion of said interior and (2) has a plurality of cutting ridges situated about its circumference, the remaining portion of said rod acting as a guide handle which extends outwardly from said proximal surface and is concentric with the central long axis of said first portion, said handle further having a means thereon for imparting a twisting motion to said reamer/alignment guide,

(D) attaching a plateau planer to said guide handle, said planer comprising a planar abrading surface, a handle and a shaft connecting said planar abrading surface to said handle, said planer having a passage therethrough adapted to cooperatively engage said guide handle and to allow the planar abrading surface to be transversely rotated about the central long axis of said guide handle while it is in contact with the proximal surface of said tibia to flatten said proximal surface transversely with respect to the central long axis of the guide handle, said planar abrading surface containing a plurality of space cutting ridges which are planar and are situated transverse to the central long axis of said guide handle and further having a recessed area thereon to avoid trauma to anatomical members found about the intercondylar fossa of the proximal surface of the tibia,

(E) modifying said proximal surface of the tibia through the use of said planer until said surface is smooth, planar and transverse to the central long axis of said guide handle,

(F) trimming any remaining bone from the proximal surface of the tibia to present a smooth, flat surface on which a proximal tibial prosthesis can be affixed, and

(G) removing the reamer/alignment guide.

4,467,802

SURGICAL GRIPPING INSTRUMENT

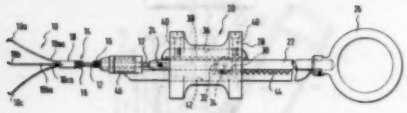
Harald Maslanka, Im jungen Steigle 6, D-7200 Tuttlingen, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,202

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012447

Int. Cl.³ A61B *17/28*

U.S. Cl. 128—321 **6 Claims**



1. An improved surgical gripping instrument for introduction into body cavities of the type including a transmission cable having a sheathing at least partially along the length and a core with gripping elements at one end of the cable core, said gripping elements moving closer to each other in gripping, tong-like fashion upon extending the sheath over the gripping elements in a first direction toward the one cable end and a manual operating device including a finger hold and a thumb hold movable relative to each other, the improvement comprising:

first means fixedly securing the thumb hold to the cable core at a point spaced from the one cable core end; and

reversing means connecting between the cable sheathing and the finger hold, said reversing means causing said sheathing to be moved in said first direction as said finger hold is moved opposite to the first direction and toward said thumb hold,

whereby said one cable core end remains in a substantially constant position upon bringing the finger hold toward the thumb hold so that delicate adjustment of the gripping elements relative to a sample can be made.

4,467,803

ORAL TEMPORARY TOTAL HEMOSTATIC CLAMPS

Tuyen N. Ngo, 495 E. Williams St., #5, San Jose, Calif. 95112

Filed Apr. 1, 1982, Ser. No. 364,215

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **1 Claim**

1. A surgical instrument for hemostasis of the entire upper or lower lip comprising:

a pair of integral transversely elongated lip-shaped jaw members, said jaw members having right and left parts and being curved to conform to the whole upper or lower lip adapted to totally stop blood flow in the entire surgical field when closed together, said jaw members including thereon an interlocked longitudinally movable adjustable means for changing the size of the jaws to adapt to different lip sizes, said adjustable means comprising a curved channel means in one of said jaw parts and a curved rod-like segment in the other part of said jaws, said rod segment being slidably received in said curved channel means;

two pairs of arms for maintaining constant hemostatic pressure throughout the entire upper or lower lip, each pair of arms connected to said jaw members at one end and comprising upper and lower arm pairs, each pair being pivotally connected intermediate the ends, said arm pairs also including at the opposite ends thereof an adjustable pressure regulating means comprising a bolt like locking bar pivotally connected on one of said pair arms and a bar receiving slot and nut means on the other of said pair arms which receives said bar, said bolt like bar having two separated thread segments, the distal thread segment being

used for keeping the nut means on the bar when releasing the instrument, the proximal thread segment being used to release the pressure gradually in order to easily identify which vessels are still bleeding so that a surgeon can easily stop each vessel from bleeding by regular hemostatic clamps.

4,467,804

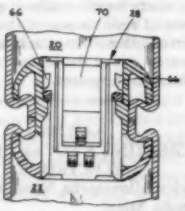
ANASTOMOTIC DEVICE

Thomas G. Hardy, Columbus, Ohio; Alan L. Kaganov, Danbury, Conn., and W. G. Pace, Columbus, Ohio, assignors to American Cyanamid Company, Stamford, Conn., a part interest

Continuation-in-part of Ser. No. 198,448, Oct. 20, 1980, abandoned. This application Jul. 27, 1981, Ser. No. 287,500

Int. Cl.³ A61B *17/11*

U.S. Cl. 128—334 C **2 Claims**



1. An anastomosis device for use in the surgical joining of the free ends of two tubular members to be anastomosed, said device comprising: a pair of identical ring members for securement to the free end of each of the tubular members to be anastomosed, each of said ring members having an inner and an outer surface and a plurality of slots and apertures therein; two mating prongs and two separate prongs joined to and depending from each of said ring members, said prongs cooperatively and alternatively mating with each other to form an annular coupling tube connecting said ring members, said coupling tube having a constant inner diameter; cooperatively connectable engaging pawls and locking slots formed in said separate and mating prongs enabling the securement of said ring members at first and second predetermined distances from each other whereby said tubular member free ends are ultimately positioned contiguous to each other over said ring members and around said engaged separate and mating prongs; a purse-string suture extending around each tubular member free end

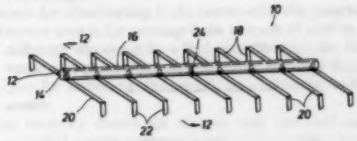
pulling and holding said free end over said ring member, around said engaged separate and mating prongs forming said annular coupling tube, and contiguous to the other tubular member free end, said separate prongs each having a single engaging pawl to a first location and two engaging pawls at a second location, and each of said mating prongs having a single locking slot whereby said single engaging pawl engages said locking slot and secures said ring members at a first predetermined distance from each other to enable the positioning of said tubular member free ends over said ring members and the placement of said purse-string suture therearound and said two engaging pawls engage said locking slot and secure said ring members at a second predetermined distance from each other when said ring members are moved toward each other to position said tubular member free ends contiguous to each other and enable said free ends to grow together and approximate the inner, middle and outer surfaces of the tubular member without necrosis.

4,467,805

SKIN CLOSURE STAPLING DEVICE FOR SURGICAL PROCEDURES

Mamoru Fukuda, 1260 Hardy, Bridge City, Tex. 77611

Filed Aug. 25, 1982, Ser. No. 411,470
Int. Cl.³ A61B *17/08*
U.S. Cl. 128—334 C **19 Claims**



1. A skin opening and closure device for surgical procedures, comprising:

(a) first and second elongated locking strips each having elongated mating locking ridge means formed thereon, said locking ridge means of said locking strips releasably securing said locking strips in assembly along the lengths thereof and being locatable along the length of an intended surgical incision;

(b) a plurality of staple elements being secured in spaced relation along the length of each of said locking strips for securing said locking strips to the skin of a patient undergoing surgery; and

(c) with said staple elements secured to the skin of the patient, said locking strips being separatable to expose the skin of the patient along the line of intended incision and upon completion of the surgical procedure being forcible into interlocking assembly to close the incision.

4,467,806

OSMOTIC CERVICAL DILATOR

Pouru Bhiwandiwala, Chapel Hill, and Robert G. Wheeler, Durham, both of N.C., assignors to Repromed, Inc., San Antonio, Tex.

Continuation of Ser. No. 257,816, Apr. 27, 1981, abandoned. This application Mar. 10, 1983, Ser. No. 472,385
Int. Cl.³ A61M *29/00*
U.S. Cl. 128—341 **21 Claims**

10. A method of dilating a cervix over a period of hours by withdrawing fluid from the cervix by osmosis without exerting traumatic dilating force on the cervix comprising the steps of:

(a) placing a dilator, comprising a compressed biocompatible foam sponge containing a tissue compatible salt of high osmotic activity sufficient to osmotically displace fluid from the cervix without exerting traumatic force on the cervix, in close proximity to the cervix in order to bring the salt into osmotic communication with the cervix;

(b) gradually releasing the salt in amounts adapted to osmotically displace fluid from the cervical tissue; and

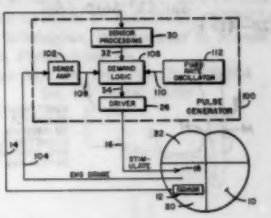
(c) absorbing with the sponge the displaced fluid from the cervical tissue thereby allowing the cervix to soften over said period of hours and dilating the cervix without exerting traumatic dilating forces thereon.

4,467,807

RATE ADAPTIVE DEMAND PACEMAKER

Gene A. Bornzin, Coon Rapids, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 23, 1981, Ser. No. 323,507
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **7 Claims**



1. A demand heart pacemaker for providing stimulating pulses to the heart at a predetermined rate in the absence of naturally occurring heartbeats comprising:

sensing means for sensing naturally occurring heart signals and generating a reset signal;

pulse generator means for generating stimulating pulses at a minimum pacing rate, including timing means for providing each stimulating pulse separated by an escape interval corresponding to the pacing rate and reset means responsive to a reset signal for resetting said timing means and restarting the escape interval;

means for measuring a physiological parameter indicative of the level of cardiac output demanded by the patient's body and for providing an escape interval modifying signal; and

means responsive to the escape interval modifying signal for adjusting the escape interval to provide pacing pulses on demand at a minimum rate correlated to the cardiac output requirements of the patient.

4,467,808

METHOD FOR PREVENTING AND TREATING OSTEOPOROSIS IN A LIVING BODY BY USING ELECTRICAL STIMULATION NON-INVASIVELY

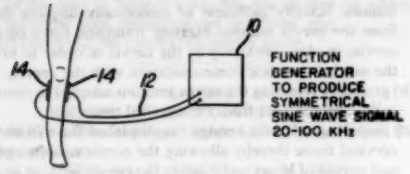
Carl T. Brighton, Malvern, and Solomon R. Pollack, Dresher, both of Pa., assignors to Biolectron, Inc., Hackensack, N.J.

Filed Sep. 17, 1982, Ser. No. 419,431
Int. Cl.³ A61N *1/06*
U.S. Cl. 128—419 F **8 Claims**

1. A non-invasive method of preventing and/or treating osteoporosis in bone in a living body comprising:

applying electrodes to a treatment area on a body and supplying to said electrodes an alternating current stimula-

tion signal in the ultrasonic frequency range of about 20 to 100 KHz to cause a current to flow in a body region



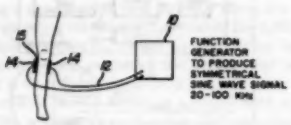
affected by osteoporosis to thereby inhibit rarefication of bone mass.

4,467,809

METHOD FOR NON-INVASIVE ELECTRICAL STIMULATION OF EPIPHYSEAL PLATE GROWTH

Carl T. Brighton, Malvern, Pa., assignor to Biolectron, Inc., Hackensack, N.J.

Filed Sep. 17, 1982, Ser. No. 419,433
Int. Cl.³ A61N *1/06*
U.S. Cl. 128—419 F **9 Claims**



1. A non-invasive method of stimulating growth in the epiphyseal plate in the bone of a living body comprising:

applying electrodes to the body of a subject in the vicinity of the epiphyseal growth plate of a bone; and

supplying to said electrodes an alternating current stimulation signal in the ultrasonic frequency range of about 20 to 100 KHz for a sufficient period of time to effect an increase in the growth of said bone as compared with any bone growth that would occur naturally.

4,467,810

MULTI-MODE MICROPROCESSOR-BASED PROGRAMMABLE CARDIAC PACER

William Vollmann, Miami Lakes, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Sep. 30, 1982, Ser. No. 430,507
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **13 Claims**

1. A cardiac pacer having an atrial tachycardia response mode, comprising

atrial sense means for producing an output indicative of atrial activity,

normal pacing logic means for producing stimulation outputs at a predetermined minimum rate including a clock register for keeping time, means for regularly incrementing said clock register, means for resetting said clock register upon the expiration of a minimum rate interval or an atrial sense output, whichever comes first, and means for producing a stimulation output when said clock register attains a predetermined number,

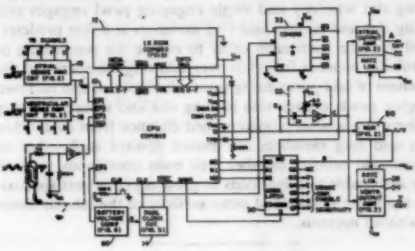
register means for determining a maximum rate interval,

register means for determining an atrial refratory period,

means for inhibiting said atrial sense means output to said resetting means during said atrial refractory period,

means for monitoring said atrial sense means output during the interval between the end of said atrial refractory period and the end of said maximum rate interval for producing an arrhythmia signal,

means responsive to said arrhythmia signal for altering the mode of operation of said normal pacing logic means so as to disassociate the ventricles from the atria, and



2:1 block means for setting said atrial refractory period equal to said maximum rate interval,

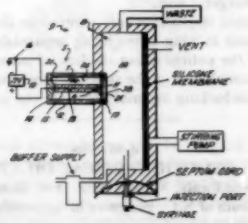
whereby every other atrial sense means output exceeding the maximum rate is inhibited and said arrhythmia signal is disabled.

4,467,811

METHOD OF POLAROGRAPHIC ANALYSIS OF LACTIC ACID AND LACTATE

Leland C. Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Continuation-in-part of Ser. No. 63,159, Aug. 2, 1979, Pat. No. 4,401,122. This application Feb. 8, 1982, Ser. No. 346,951
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **7 Claims**



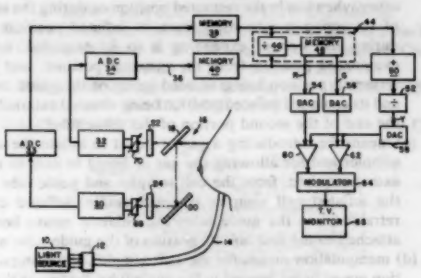
7. A method of measuring the ratio of lactic acid or derivatives thereof to pyruvic acid or derivatives thereof in whole mammalian blood comprising measuring the lactic acid in said blood by reacting said lactic acid or derivatives thereof with lactic oxidase to produce pyruvate and hydrogen peroxide and measuring the hydrogen peroxide polarographically; and

adding NADH and lactic dehydrogenase to said blood, thereby converting pyruvic acid or derivatives thereof in said blood to lactic acid and subsequently reacting the lactic acid with lactic oxidase to produce hydrogen peroxide and measuring the hydrogen peroxide polarographically.

4,467,812
TRANSILLUMINATION APPARATUS

Milton Stoller, West Hartford, Conn., assignor to Spectrascan, Inc., So. Windsor, Conn.

Filed Jul. 19, 1982, Ser. No. 399,866
Int. Cl.³ A61B 6/12
U.S. Cl. 128—664 10 Claims

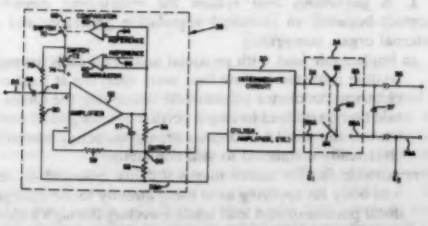


1. Transillumination apparatus comprising:
means for generating light comprising at least two different wavelengths;
means for illuminating body tissue with the generated light;
detector means for sensing light at each of said at least two different wavelengths which pass through the illuminated tissue and generating signals commensurate therewith;
means for encoding the signals produced by said detector means;
first memory means for storing said encoded signals, the encoded signals commensurate with the same points in the illuminated tissue resulting from detection of light of said at least two different wavelengths being stored at simultaneously addressable locations;
second memory means for storing at last a pair of display correlated data values for each ratio of the signals which may be stored in said first memory means;
means for addressing said second memory means with the encoded detector means signals which have been stored at simultaneously addressable memory locations of said first memory means whereby a pair of said display correlated data values characteristic of each illuminated point in the tissue may be read from said second memory means; and
means responsive to the signals read from said second memory means for producing a display which represents the absorption characteristics of the tissue at the said at least two different wavelengths.

4,467,813
BIOLOGICAL SIGNAL SOURCE AMPLIFIER

Richard A. Schomburg, Hillsboro, Oreg., assignor to Cardiac Resuscitator Corporation, Wilsonville, Oreg.

Filed May 4, 1982, Ser. No. 374,697
Int. Cl.³ A61B 5/04
U.S. Cl. 128—702 7 Claims

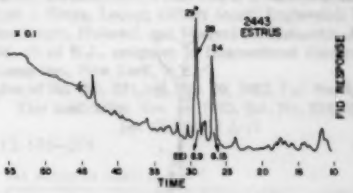


1. In a biological-signal-source amplifier, a signal input circuit for facilitating recovery from an input signal of excessive amplitude, said input circuit comprising:
(a) input coupling means, having a characteristic reactance, for coupling an input signal to said amplifier;
(b) first comparator means, responsive to said input coupling means, for comparing the amplitude of said coupled input signal to a first reference value;
(c) second comparator means, responsive to said input coupling means, for comparing the amplitude of said coupled input signal to a second reference value;
(d) current source means, connected to said input coupling means and responsive to said first and second comparator means, for supplying to said input coupling means additional current of one polarity when said coupled input signal exceeds said first reference value, and additional current of the opposite polarity when said coupled input signal is less than said second reference value, thereby decreasing the time required for said coupled input signal to return to a value between said first and second reference values.

4,467,814
METHOD FOR DETECTING BOVINE ESTRUS BY DETERMINING METHYL HEPTANOL CONCENTRATIONS IN VAGINAL SECRETIONS

George Preti, Philadelphia, Pa., assignor to Monell Chemical Senses Center, Philadelphia, Pa.

Filed Mar. 19, 1982, Ser. No. 359,954
Int. Cl.³ A61B 10/00
U.S. Cl. 128—738 16 Claims



1. A method for determining when a cow is in estrus, comprising steps of:
monitoring said cow's vaginal secretions over time to detect an increase in the amount of at least one indicator compound contained in said secretions, said indicator compound being an eight carbon alcohol and having a gas chromatographic ethyl ester index of between about 8.1 and 8.9, said increase in the amount of said indicator compound being indicative of estrus.

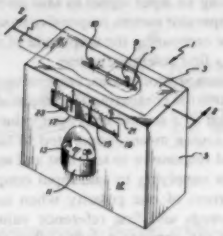
4,467,815
APPARATUS FOR MEASURING CONDITIONAL CHARACTERISTICS OF A BODY PART

William J. O'Brien, 14205 Nambe, NE., Albuquerque, N. Mex. 87123, and James N. Cirsulo, 455 Live Oak Rd. NE., Albuquerque, N. Mex. 87122

Filed Sep. 9, 1982, Ser. No. 416,287
Int. Cl.³ A61B 5/10
U.S. Cl. 128—740 8 Claims

1. Apparatus for measuring the sensory condition of the skin, said apparatus comprising:
a housing including a surface for contacting the skin, said surface including an aperture,
two needlelike probes having radiused ends simultaneously projectable through said aperture for contacting and applying pressure to the skin,
platform means disposed within said housing, carrying said probes and including a threaded hole, for advancing and retracting said probes simultaneously relative to said sur-

face, said probe means including probe displacement means for adjusting the separation between probes and,



bolt means rotatably mounted to said housing and engaging said threaded hole for advancing and retracting said platform means in response to rotation of said bolt means.

4,467,816

DEVICE FOR COLLECTING CELL MATERIAL

Gert Schlüter, Liederbach, and Jürgen Stahl, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 22,865, Mar. 21, 1979, abandoned. This application Jul. 22, 1981, Ser. No. 285,843

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812709

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—756 **6 Claims**

1. Device for collecting cell material from the endometrium which comprises:

(a) a guide tube comprised of a first hollow portion and a second hollow portion, the second portion of the guide tube being narrower than the first portion of the guide tube and ending in a distal rim, the second portion of the guide tube being narrow enough to allow insertion thereof into the uterus, the first portion of the guide tube being too wide to allow insertion thereof into the uterus, the interface of the first portion and the second portion forming a ledge between the first portion and the second portion of the guide tube, the interface providing a stop and preventing insertion of the first portion of the guide tube into the uterus;

(b) an elastic cell sampler having the shape of an inflatable balloon, which has a first section and a bulbous second section terminating in a distal end, the cell sampler being retractable into the second guide tube portion whereby the cell sampler is evaginated, the first section of the cell sampler being narrower than the bulbous second section when the cell sampler is in its normal, extended, non-evaginated position and in its inflated, extended, non-evaginated position, the bulbous second section of the cell sampler being wider than the guide tube, the end of the first section of the cell sampler being open, the open end of the first section of the cell sampler being pulled over the rim of the end of the second portion of the guide tube, and the outer sides of the cell sampler not contacting each other when it is in the retracted position or during the step of retracting it into itself from its inflated position or during the step of expanding it to its extended, non-evaginated position from its retracted position, and its retracted position being situated inside of the guide tube and its extended inflated position being situated external to the end of the second portion of the guide tube;

(c) means for introducing a gas or liquid to inflate the cell sampler and for allowing the gas or liquid to exit, to the extent required, from the cell sampler and guide tube as the inflated cell sampler is concurrently deflated and retracted into the guide tube, the inflation means being attached to the first hollow portion of the guide tube; and

(d) manipulation means for the cell sampler, the manipulation means being located in the guide tube, having one end thereof extending into the cell sampler, when the cell sampler is in its extended, non-evaginated position, with such end thereof being attached to the inside surface of the end of the bulbous second section of the cell sampler, and having the other end thereof protruding out of the other end of the guide tube, the manipulation means providing means for retracting the cell sampler, when it is in its normal, extended, non-evaginated position, into the guide tube, the inflation means allowing deflation of the inflated cell sampler as the cell sampler is retracted, extension of the evaginated cell sampler into the normal, extended, non-evaginated position and inflation of the cell sampler when in the normal, extended, non-evaginated position to effect collection of cell material.

4,467,817

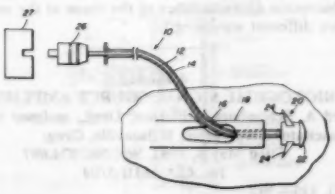
SMALL DIAMETER LEAD WITH INTRODUCING ASSEMBLY

Donald L. Harris, Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 255,703, Apr. 20, 1981, abandoned. This application May 18, 1983, Ser. No. 495,451

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—786 **5 Claims**



1. A pervenous lead system for establishing electrical contact between an electrical stimulation generator and an internal organ, comprising

an implantable lead with proximal and distal ends having a flexible insulated hollow lead body carrying at least one electrical conductor substantially occupying the lumen of said body, said lead having a portion of enlarged diameter toward the distal end and an organ-contacting electrode electrically connected to said conductor,

removable flexible sleeve means slidably mounted on said lead body for applying axial force directly to the enlarged distal portion of said lead while traveling through a blood vessel, and

means at the proximal end for connecting said conductor to the generator,

whereby the lead can be urged flexibly through a blood vessel with stylet-like action by externally manipulating said sleeve means.

4,467,818

LOW PROFILE AXIAL FLOW COMBINE

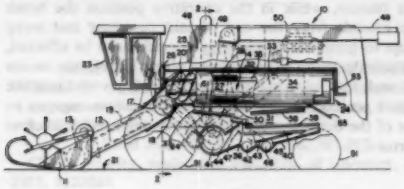
Edward Donaldson, and Kenneth A. A. Frisk, both of Brantford, Canada, assignors to 103100 Canada Inc., Brantford, Canada

Filed Jan. 10, 1979, Ser. No. 2,296

Claims priority, application Canada, Oct. 31, 1978, 315533

Int. Cl.³ A01F *12/60, 12/44*

U.S. Cl. 130—27 T **1 Claim**



1. In an axial combine having a generally horizontal fore and aft extending rotor-rotor casing combination, a saddle grain tank extending over and down opposite sides of said rotor-rotor casing combination with a horizontal discharge auger extending through the boots of said grain tank and through an auger housing interconnecting the same, and cleaning apparatus nested beneath the threshing and separating portions of said rotor-rotor casing combination, the improvement which comprises the grain pan of the cleaning apparatus having its upper end extending over said auger housing of said grain tank and in between the sides of said tank and having a stepped lower end discharging onto the lower end of a chaffer.

4,467,819

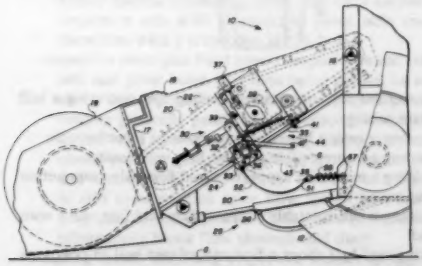
COMBINED STONE TRAP CLOSING MECHANISM

Glenn A. Musser; Stuart O. Swiler, and Larimer J. Knepper, all of New Holland, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Sep. 22, 1983, Ser. No. 534,998

Int. Cl.³ A01F *12/16*

U.S. Cl. 130—27 JT **20 Claims**



1. In a combine harvester having a mobile frame adapted for movement across a field; threshing means mounted on said frame for threshing crop material; a feeder house pivotally connected to said frame to convey crop material to said threshing means, said feeder house including a floor and an elevator cooperable with said floor to convey crop material to said threshing means, said floor having a trap door pivotally movable from a closed position in which said trap door and said floor form a surface over which said elevator conveys said crop material and an opened position in which an opening is made in said floor to expel crop material from within said feeder house; detection means for detecting the presence of non-crop material within the flow of crop material over the surface formed by said floor and said trap door, ejection means operatively connected to said detection means and said trap door to effect a movement of said trap door from said closed position to said opened position upon the detection of non-crop material and permit the ejection thereof through said opening; a crop harvesting header connected to said feeder house for collecting crop material and discharging said collected crop material into said feeder house; and header lift means interconnecting said frame and said feeder house for selectively raising said feeder house and said attached header by pivoting said feeder house about the pivotal connection with said frame from a lowered position to a raised position, the improvement comprising:

closing means operatively connected to said trap door to effect a movement of said trap door from said opened position to said closed position upon actuation of said header lift means to raise said feeder house and attached header.

4,467,820

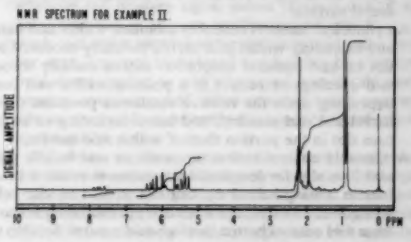
SYNTHESIS OF TRICONJUGATED DIENONES AND NOVEL INTERMEDIATES USED IN SAID PROCESS

William J. Evers, Locust; Gilbert Stork, Englewood; Braja D. Mookherjee, Holmdel, and Howard H. Heinsohn, Jr., Freehold, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 431,268, Sep. 30, 1982, Pat. No. 4,457,392. This application Nov. 14, 1983, Ser. No. 551,551

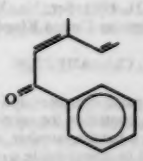
Int. Cl.³ A24B *3/12*

U.S. Cl. 131—276 **4 Claims**



1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of smoking tobacco compositions and smoking tobacco articles comprising the step of intimately admixing with said consumable material an aroma augmenting or enhancing quantity of at least one compound having a structure selected from the group consisting of:

(i)



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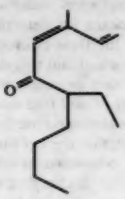
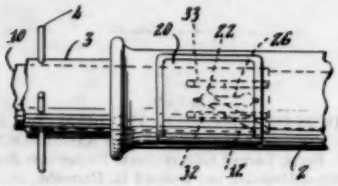


4,467,821

ACTUATOR CONTROL FOR RETRACTABLE BRISTLE BRUSHES

James B. Stewart, Randolph, N.J., assignor to Conair Corporation, Edison, N.J.

Filed Jul. 7, 1983, Ser. No. 511,632
Int. Cl.³ A45D 2/00
U.S. Cl. 132—40 6 Claims



1. A retractable bristle hair curling brush adapted for simple, one-handed control of projection and withdrawal of bristles, said brush including,

a handle having an axially-projecting cylindrical barrel, said barrel including a plurality of openings therein on said barrel surface.

A cylindrical mandrel rotatably mounted within said handle and extending within said barrel, pivotally mounted bristles on said mandrel adapted to extend radially through said openings or retract to a position within said barrel depending upon the relative rotational positions of said barrel and said mandrel, said barrel including an angular cam slot in the portion thereof within said handle,

A slideable control button mounted on said handle above said cam slot for longitudinal movement relative to said handle, a longitudinal control slot in said handle below said control button, and a control pin extending inwardly from said control button through said control slot into said angular cam slot,

whereby longitudinal motion on said control button serves to rotate said mandrel relative to said barrel and thereby project and retract said bristles in a radial direction.

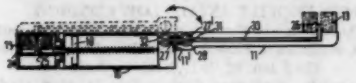
4,467,822

TOOTHBRUSH

Victor C. Blackwell, 69, Westminster Dr., Bromborough, Wirral, Merseyside, England

Filed Sep. 21, 1981, Ser. No. 304,002
Claims priority, application United Kingdom, Sep. 25, 1980, 8030886
Int. Cl.³ A63H 27/00
U.S. Cl. 132—84 B 10 Claims

1. A combined toothpaste dispenser and toothbrush device comprising an elongate container for receiving or containing toothpaste and forming a handle member, a toothbrush member pivotally connected or connectable to said container and supporting bristles, ducting means leading or capable of leading from the container to the bristles of said brush member, and means for enabling paste to be urged through said ducting means to said bristles, said toothbrush member being adapted to be pivotally displaced relative to said elongate container so that in an inoperative position the brush member is juxtaposed or lies along or adjacent said container with the bristles of the brush member located within a space or recess within the handle member or a displaceable paste dispensing member



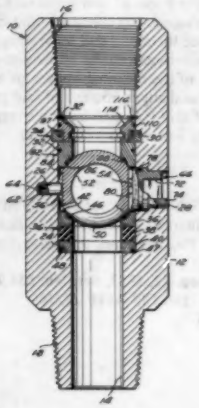
adjacent thereto, while in the operative position the brush member extends from the end of said container and away therefrom to permit teeth-cleaning operations to be effected, and wherein the space or recess has a pin or like closure means situated such that when the brush member is pivoted into the inoperative position the pin or like closure means engages an aperture of the ducting means opening at the bristles to close the aperture.

4,467,823

HIGH PRESSURE BALL VALVE

Charles D. Shaffer, and Ivan Miller, both of Fullerton, Calif., assignors to Shafco Industries Inc., Anaheim, Calif.

Filed Nov. 4, 1981, Ser. No. 318,208
Int. Cl.³ F16K 5/20
U.S. Cl. 137—15 15 Claims



1. A method for compression loading and operating a ball valve comprising:

providing a casing having a flow passage therethrough;

providing a compressible annular first valve seat;

providing a means for supporting said first valve seat within said casing

providing a ball rotatably supported by said first valve seat; and

rotating said ball about a first axis of said ball to compress said first valve seat against said supporting means and to thereby effect a tight seal between said ball and said first valve seat; and

rotating said ball about said first axis of said ball to open and close said valve.

9. A high pressure ball valve comprising:

a casing having a flow passage therethrough;

first and second annular seats within said casing, each having a rigid face;

a ball rotatably mounted and sealed between said rigid faces of said first and second seats within said casing, said ball having a bore therethrough perpendicular to the ball's rotational axis to permit opening and closing said passage to fluid flow by rotating said ball;

means for supporting one side of said first seat within said casing, while the other side of said first seat rests against said ball; said other side comprising said rigid face;

said first seat being compressible to permit said first seat to be loaded through compression to create a tight seal between said ball and said first and second seats, said other side of said first seat being axially supported during said pre-compression, only by said ball.

4,467,824

SELF-CLOSING FIRE DAMPER FOR DUCT

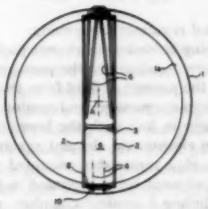
Wilhelm P. Strulik, 2, rue d'Heurtebise, Roussemeau, Villeneuve-sur-Yonne, France, and Jürgen Eidmann, Feldbergstr. 9, 6384 Schmitten, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 387,015

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123555

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—74 **3 Claims**



1. A self-closing fire-damper assembly for a duct, said damper assembly comprising:

a support adapted to be secured in said duct and having a pair of support tabs defining respective parallel and spaced-apart pivot axes traversing said duct;

respective damper flaps each having a straight rear edge extending parallel to the respective axis and each being formed adjacent the respective rear edge with a pair of axially spaced upstanding pivot tabs each formed at the respective axis with a respective pivot hole and offset therefrom with a respective spring hole,

respective pivot pins fixed in said support tabs and extending into said pivot holes, said flaps being pivotal on said pins about the respective axes between an open position extending generally parallel to and spaced from each other in line with said duct and flanking said pivot axes and a closed position generally coplanar transverse to said duct and with the rear edges butting, whereby said flaps define in said open position open flow spaces between and to both sides of said flaps and in said closed position said flaps substantially block flow through said duct;

biasing means including respective hairpin springs braced between said flaps and each having one leg anchored on said support and another leg engaged in the spring hole of the respective pivot tab for urging said damper flaps continuously into said closed position; and

means including a fusible link connected between said flaps offset from said axes and transversely bridging one of said flow spaces for retaining said flaps in said open position unless said link is heated beyond a predetermined temperature.

4,467,825

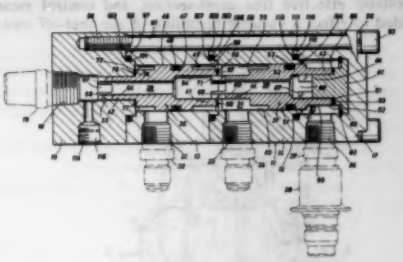
SHUTTLE VALVE ASSEMBLY

Andrew B. Boyd, Houston, Tex., assignor to The Andy Boyd Company, Houston, Tex.

Filed Jan. 17, 1983, Ser. No. 458,201

Int. Cl.³ F16K *11/10*

U.S. Cl. 137—112 **14 Claims**



1. A shuttle valve assembly comprising:

(a) A body having a plurality of nested housings, an outlet end housing having a fluid signal outlet and a closed end housing, and means for securing said housings into an integral structure;

(b) said housings having an aligned axial cylindrical passageway;

(c) a plurality of spool valve members with an axial passageway opening into said outlet, said valve members mounted within said cylindrical passageway and adapted to move axially between opened and closed positions therein, individually and in a nested arrangement for controlling flows between said inlet ports and said cylindrical passageway;

(d) each said housing having an inlet signal port in communication with said cylindrical passageway;

(e) said valve members moved into nested arrangement towards said closed end housing by a primary fluid signal applied at said inlet port on said closed end housing whereby the primary signal passes through one of said valve members in an open position to said outlet;

(f) each said valve member separated from said valve member next closest to said closed end housing by a superior fluid signal applied to said inlet signal port in said nested housing containing said valve member being separated into an open position whereby this superior signal appears at said outlet; and

(g) said valve members moved into nested arrangement towards said outlet end housing by a superior fluid signal applied to said inlet signal port in said closed end housing whereby this superior fluid signal passes through another of said valve members in an open position and appears at said outlet.

4,467,826

DEVICE FOR PREVENTING THE CO-MEASURING OF GASEOUS ADMIXTURES IN THE DISPENSING OF LIQUIDS

Werner Lorentz, Hamburg, Fed. Rep. of Germany, assignor to Alfons Haar Maschinenbau GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,001

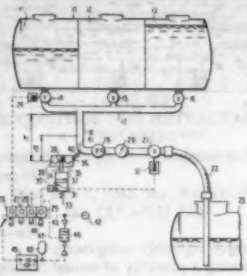
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007688

Int. Cl.³ F16K *11/10*

U.S. Cl. 137—188 **17 Claims**

1. A device for preventing the co-measuring of gaseous admixtures in the dispensing of liquids from a plurality of first containers into a second container comprising a plurality of first containers suitable for holding a liquid desired to be dispensed, each of said first containers having a separately operable bottom valve, each of said first containers being connected

with a discharge conduit containing said bottom valves, a connecting conduit connecting the discharge conduits to each other, a conveying conduit connected to said connecting conduit, means for measuring flow in said conveying conduit, shut-off means arranged connected to said conveying conduit, a pressure measuring device arranged to sense changes in the pressure in the conveying conduit, the shut-off means having a controllable effective free cross-section, and control means provided to effect a variable throttling of the shut-off means



depending upon said change in pressure so that throttling of said shut-off means is initiated at a first positive pressure value, and the shut-off means is closed at a lower second positive pressure value, said control means including a complusory circuit by which the said shut-off means is automatically closed if one of said bottom valves is opened, said compulsory circuit comprising a time member which after the closing of the shut-off means opens the latter again after the lapse of a predetermined time period.

4,467,827

VENTING AND DEGASIFYING VALVE FOR A LIQUID-FILLED SYSTEM

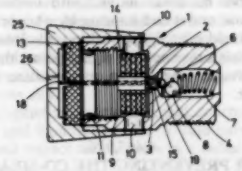
Max Pashrig, Orselina, Switzerland, assignor to Lacrex Brevetti S.A., Orselina, Switzerland

Filed Jan. 19, 1983, Ser. No. 459,452

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1982, 8202552

Int. Cl.³ F16K *24/00*

U.S. Cl. 137—197 **5 Claims**



1. A venting and degasifying valve, for a liquid-filled system, comprising a stopper for screwing into an opening in the system and which is subdivided, by a partition provided with a central valve opening, into an inner chamber and an outer chamber, a valve ball disposed in the inner chamber and forced by a compression spring into the valve opening, a closure screw engaged an internal thread in the outer chamber and having a stem on which are disposed stopping rings which swell when subjected to moisture, venting openings leading outwards from the outer chamber in register with the stopping rings and a pusher formed as an extension of the stem and disposed, in the screwed-in position of the closure screw, to project through the valve opening and into the inner chamber for lifting the valve ball, characterised in that, in the closure screw, in the stem, and possibly in the pusher, there is a venting channel displaceably accommodating, with a clearance, a spindle which protrudes at the end, remote from the valve ball, of the closure screw and on the inner end of which at least a portion of the pusher is so fastened that a closure surface, formed on a reverse end of said portion, can be lifted from the venting channel end by means of the spindle.

4,467,828

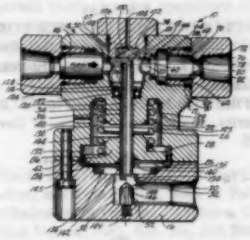
FLUID REGULATOR

Donald R. Gneiding, Fullerton, Calif., assignor to Dual Fuel Systems, Inc., Los Angeles, Calif.

Filed Feb. 12, 1982, Ser. No. 348,514

Int. Cl.³ F16K *17/34*

U.S. Cl. 137—484.4 **6 Claims**



1. An improved regulator comprising:

(a) a body having at least one entrance passage for admitting a fluid, a bore opening into the passage, at least one exit passage for the passage of fluid from the body and spaced from the entrance passage, and seating means in the entrance passage in line with the bore, the seating means including an elastomeric element against which the tube seats and a plug removably mounted to the body, the elastomeric element being mounted in the plug, the exit passage including a control chamber, a necked passage and an exit port,

(b) a tube in the bore and having an entrance in communication with the entrance passage and an exit in communication with the exit passage, the tube seating against the elastic element, the tube entrance having an interior chamfer to its outside diameter to present an annular edge for seating on the seating means and when seated no area subject to entrance passage pressure normal to the line of movement of the tube, the plug having a vent to atmosphere from the side of the elastomeric element opposite the tube;

(c) a control element secured to the tube and movable with the tube, the element having an exit pressure side subject to pressure in the exit passage and an opposition side, the control chamber being adjacent to and facing the control element such that pressure in the control chamber urges against the control element, the necked passage opening into the control chamber and having a width less than the width of the control chamber, the exit port opening into the necked passage and the outside of the regulator, the exit end of the tube being in the necked passage such that the fluid discharging therefrom aspirates fluid from the control chamber to lower the pressure there,

(d) biasing means acting between the body and the opposition side of the control element in opposition to pressure in the exit passage, the biasing means includes a piston acting on the control element;

(e) means sealing the exit pressure side of the control element from the opposition side; and

(f) an exit seat at the exit end of the tube and mounted to the body, the exit seat being positioned to substantially close the tube when the tube moves against it in response to some pressure in the exit passage below some predeter-

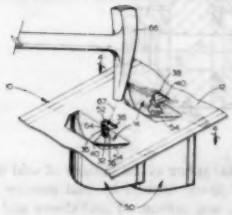
mined pressure and corresponding to a loss of pressure downstream of the regulator, exit seat permitting a minute leak of fluid into the exit passage from the tube when the tube is against it.

4,467,829

TURNING VANE RAIL

Jerome J. Myers, 7570 Mariner Dr., Maple Grove, Minn. 55369

Filed Apr. 29, 1982, Ser. No. 373,019
Int. Cl.³ B21D *39/00*
U.S. Cl. 137—561 A **2 Claims**



1. A rail assembly for supporting a plurality of turning vanes for airflow, the rail assembly comprising:

a base sheet having a longitudinal axis;

a plurality of vane guide plates spaced along the longitudinal axis and formed by slitting each vane guide plate from the base sheet and bending each vane guide plate along a bend line to a position generally perpendicular to the base sheet, each vane guide plate leaving an opening in the base sheet which is spaced longitudinally on the sheet from the bend line of the next vane guide plate, the vane guide plates being adapted to be contacted by a wall of the vane to be supported; and

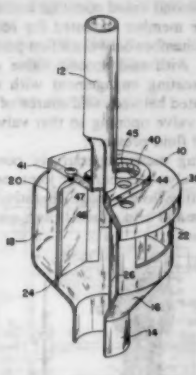
the base sheet being provided with apertures formed through the base sheet, each aperture being partially in one vane guide plate and partially on the portion of the base sheet between the bend line and the next adjacent vane guide plate, each aperture spanning the bend line of its associated vane guide plate, and being spaced longitudinally from the opening left by the next adjacent vane guide plate to provide a wall section on the base sheet between the adjacent vane guide plates, each aperture being of a generally trapezoidal shape having end edges lying transverse to the longitudinal axis of the sheet, the longer edge of each trapezoidal aperture remaining on the sheet, and the narrower edge of each of the trapezoidal apertures being on the vane guide plate, each aperture extending from the bend line along its associated vane guide plate a desired distance, so that when a vane is supported with a vane wall against the vane guide plate a portion of the vane wall protrudes into the portion of the aperture formed on the vane guide plate immediately below the bend line, the wider portion of the trapezoidal aperture on the sheet providing an opening in which to move a striking tool to break a tab from the vane wall protruding into the portion of the aperture on the vane guide plate and bend the tab through the portion of the aperture in the vane guide plate to secure such vane to the vane guide plate, the trapezoidal shape providing a guide for the striking tool that is larger where the striking tool will pass through the plane of the base sheet.

4,467,830

CONDUIT FOR APPARATUS DISCHARGING A LIQUID

John W. Hutchinson, Fairview, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Apr. 27, 1981, Ser. No. 257,779
Int. Cl.³ F16K *24/00*
U.S. Cl. 137—590 **3 Claims**



1. A device for accepting liquid discharged from apparatus and directing the discharged liquid into the discharge side of a system that conveys the discharged liquid, and for preventing the discharged liquid from reentering the apparatus comprising:

a conduit defining an inlet through which the liquid discharge flows into said conduit, a main outlet through which the liquid discharge flows from said conduit into the discharge side of the system, said liquid discharge traveling along a normal path of flow from said inlet to said main outlet, and at least two backup outlets which provide fluid communication between the interior of said conduit and the exterior of said conduit through which at least a portion of the liquid discharge flows from the conduit when a predetermined volume of liquid discharge backs up in said conduit;

each said backup outlet defines an overflow rim over which said discharge flows through said backup outlet when said discharge occupies said predetermined volume;

said overflow rims and said inlet defining an air gap therebetween that prevents said discharge from coming into contact with said inlet before said discharge flows through said backup outlets over said overflow rims; and

a blocking member disposed within said conduit between (i) said normal path of flow of the discharged liquid through said conduit and (ii) each said backup outlet, to prevent liquid discharge deflected from said normal path of flow from passing through said backup outlets, unless the liquid discharge occupies said predetermined volume, said blocking member defining at least two openings through which liquid backing up within said conduit can flow to said backup outlets.

4,467,831

FLUID-LOGIC THYRISTOR

George F. French, 4009 Linden St., Oakland, Calif. 94608

Continuation of Ser. No. 976,539, Dec. 20, 1978, abandoned. This application Oct. 30, 1980, Ser. No. 202,125
Int. Cl.³ F15B *13/04*
U.S. Cl. 137—625.27 **2 Claims**

1. A fluid-logic thyristor comprising:

a housing formed with a first chamber having a supply port adapted for communication with a source of fluid pressure, a first valve opening, and a cylinder port;

a first valve member mounted for reciprocation within said

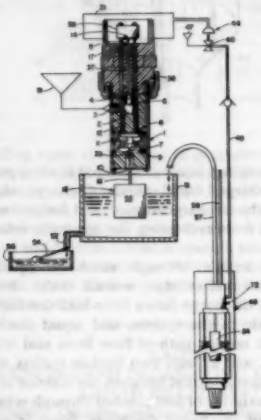
first chamber between a first position in seating engagement with said first valve opening and a second position out of seating engagement with said first valve opening and located between said source of fluid pressure and said first valve opening so that valve closure is facilitated by said fluid pressure;

a second chamber formed in said housing having an inlet opening, a second valve opening, and a exhaust port;

a second valve member mounted for reciprocation within said second chamber between a first position out of seating engagement with said second valve opening a second position in seating engagement with said second valve opening located between said source of fluid pressure and said second valve opening so that valve closure is facilitated by said fluid pressure;

valve-connecting means operatively connecting said first and second valve members for joint movement;

an interconnecting flow passage operatively connecting said cylinder port and said exhaust port; and



extension means connected to one of said valve members and adapted for connection to a variable force means;

said housing being formed with a first rod passage connecting said first chamber and said cylinder port;

said extension means including a coupler and a first connecting rod connected to said first valve member and coupler;

said first rod passage being formed with a cross section sufficient to receive said first connecting rod for freely sliding reciprocation therein and for passage of pressurized fluid therethrough;

said interconnecting passage including a plurality of passages;

said valve connecting means including a plurality of rods mounted for reciprocation in said interconnecting passages and connected to said coupler;

said interconnecting passages being formed with suffient cross section to permit free sliding reciprocation of said rods therein and for passage of pressurized fluid therethrough.

4,467,832

COCK

Hideo Tamamori, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Aug. 19, 1982, Ser. No. 409,396

Int. Cl.³ F16K *11/00*

U.S. Cl. 137—625.47 **4 Claims**

1. Cock apparatus, for selectively connecting a plurality of passages in a fluid control system, comprising:

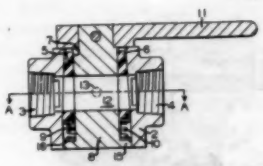
(a) a cock body having fluid passages therethrough to be selectively connected and a formed hole into which said passages open;

(b) a sleeve of elastomeric material formed for insertion into said body hole;

(c) a plug element shaped for placement within said sleeve in said body hole and freely operable for selectively connecting in predetermined patterns said fluid passages opening into said hole;

(d) at least one set of adjacent surfaces formed between said hole and said sleeve and between said sleeve and said plug element being tapered;

(e) a first annular space at the top of said sleeve, said first annular space formed by an interior surface of said cock body, said top of said sleeve and the outer surface of said plug element, said first annular space allowing upward movement of said sleeve as said sleeve becomes worn;



(f) a second annular space at the bottom of said sleeve, said second annular space formed by said interior surface of said cock body, said bottom of said sleeve and said outer surface of said plug element;

(g) a bearing plate to provide a uniform pressure distribution on said sleeve, said bearing plate having a first side adjacent to and in contact with said bottom of said sleeve at the thickest end thereof;

(h) a spring pushing means inserted within said second annular space with one end thereof being positioned for bearing engagement with a second side of said bearing plate for urging said sleeve upwardly into tight surface contact with said hole and said plug as said sleeve wears; and

(i) a base element for closing the bottom of said cock apparatus and for providing a bearing surface which cooperates with said spring pushing means for urging said sleeve upwardly, said base element and said plug element being formed as a single piece.

4,467,833

CONTROL VALVE AND ELECTRICAL AND HYDRAULIC CONTROL SYSTEM

Lawrence E. Satterwhite, and Lawrence F. Angelo, both of Conroe, Tex., assignors to NL Industries, Inc., New York, N.Y.

Continuation of Ser. No. 73,581, Sep. 7, 1979, abandoned. This application Sep. 10, 1981, Ser. No. 301,002

Claims priority, application United Kingdom, Oct. 11, 1977, 42314/77

Int. Cl.³ E21B *43/01*; F16K *31/143*

U.S. Cl. 137—637 **3 Claims**

1. An electrical and hydraulic control system for controlling a plurality of hydraulically actuated underwater devices comprising:

a control valve for controlling each of said devices including,

a valve body, said body having an inlet and an outlet,

a valve element movably positioned between the inlet and the outlet whereby movement in one direction opens communication between the inlet and outlet and movement in a second direction closes communication between the inlet and the outlet,

first and second pilot pistons positioned in the body and of equal cross-sectional areas, one of the pistons is positioned on one side of the valve element and the other of

which is positioned on the second side of the valve element,

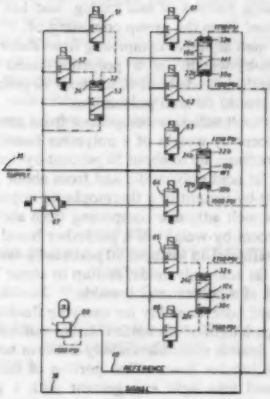
first and second pilot ports extending into said body for admitting fluid behind the first and second pistons, respectively, for moving the valve to either an open or closed position,

third and fourth pilot pistons positioned in said body and of unequal cross-sectional areas, said third piston positioned on one side of the valve element, and the fourth piston positioned on the second side of the valve element,

third and fourth pilot ports extending into said body for admitting fluid behind the third and fourth pistons, respectively, for moving the valve to either an open or closed position,

a first hydraulic manifold connected to the third pilotports of the control valves,

a second hydraulic manifold connected to the fourth pilot ports of each of the control valves,



first electrically actuated valve means having an inlet and an outlet with the inlet connected to the hydraulic fluid line, said valve being open when electrically actuated and closed when electrically deactuated,

a pilot valve having an inlet and an outlet and connected to the hydraulic manifold upstream of the third and fourth pilot ports, said pilot actuated by the first electrical actuated valve means for moving the pilot valve to the closed position when the first electrically actuated valve is electrically actuated,

a plurality of additional electrically actuated valve means each having an inlet and an outlet, the inlets of each of the additional valves being connected to the outlet of the first electrically actuated valve means, and the outlets of each additional valve being connected to one of the first and second pilot ports of each of the control valves, said additional valves being open when electrically actuated and closed when electrically deactuated.

4,467,834

DEVICE FOR CONTROLLING THE MIXTURE AND FLOW OF AT LEAST TWO FLUIDS

Jean-Denis Rochat, Plan-Les-Ouates, and Conrad Zellweger, Chene-Bougeries, both of Switzerland, assignors to LN Industries S.A., Geneva, Switzerland

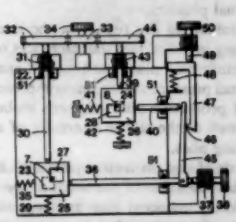
PCT No. PCT/CH81/00130, § 371 Date Aug. 16, 1982, § 102(e) Date Aug. 16, 1982, PCT Pub. No. WO82/02101, PCT Pub. Date Jun. 24, 1982

PCT Filed Nov. 20, 1981, Ser. No. 413,365

Claims priority, application Switzerland, Dec. 16, 1980, 9257/80

Int. Cl.³ F16K *11/16*

U.S. Cl. 137—637 **7 Claims**



1. Device for mixing two gases under pressure, comprising a mixing chamber, an inlet pipe for each of the two gases, a pessure regulating device making it possible to deliver each of the two gases at a specific pressure to a related adjustable constriction, wherein the two constrictions open into said mixing chamber through two orifices in a plate, said plate forming a wall of said chamber, a valve device movable parallel to said plate, the superposed parts of said valve device and said orifices of the plate comprising said constrictions, said orifices of the plate being in the shape of a parallelogram whose sides are oriented in two directions, two control elements cooperating with a calibration each action on said valve device in said two directions, one of the elements providing the control of the total flow of the mixture by causing said constrictions to vary in the same direction from zero and according to a factor of linear proportionality between the two constrictions, the other element providing the control of the ratio of the mixture by causing said constrictions to vary in the opposite direction from each other and according to the same factor of linear proportionality between the two constrictions.

4,467,835

SHUT-OFF DEVICES

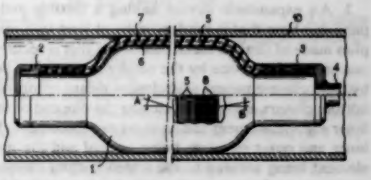
Jacques Champleboux, Clermont-Ferrand, France, assignor to Caoutchouc Manufacture et Plastiques, Clermont-Ferrand, France

Filed May 19, 1982, Ser. No. 379,876

Claims priority, application France, May 27, 1981, 81 10757

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—93 **10 Claims**



1. A device for temporarily shutting off conduits comprising (a) a flexible cylindrical sleeve expansible under powerful internal pressure,

(b) closure plugs secured in opposite ends of said sleeve, one of said plugs being imperforate and the other plug having an inlet for liquid under pressure,

(c) said sleeve having a rubber wall which is reinforced by a pair of superimposed reinforcing plies of cords embedded therein and defining an internal rubber tube and an external rubber sheath,

(d) the cords of said reinforcing plies being secured at opposite ends to the said closure plugs respectively and being crossed from one ply to the other at symmetrical angles smaller than 30° with respect to the longitudinal axis of the cylindrical sleeve

(e) said reinforcing plies constituting a resistant carcass of said sleeve of which adjacent cords of the respective plies move apart with expansion of the sleeve under the powerful internal pressure,

(f) means inhibiting the rubber of the internal rubber tube from being impelled into the interstices between the cords of the reinforcing plies when moved-apart by the powerful internal pressure said means comprising a pair of superimposed protective plies of cords embedded within the rubber wall of the sleeve internally of and adjacent said reinforcing plies,

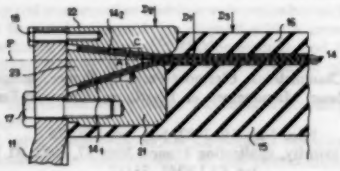
(g) the cords of said protective plies each having a diameter of less than half that of the cords of the reinforcing plies, lying closely adjacent one another, and being crossed from one ply to the other at symmetrical angles to the longitudinal axis of the cylindrical sleeve not greater than the said angles at which the cords of the reinforcing plies are crossed.

4,467,836

FLEXIBLE TUBE MEANS, ESPECIALLY FOR AN EXPANSIBLE VALVE

Bernard Ragout, Aubiere, France, assignor to Caoutchouc Manufacture et Plastiques, Bezons, France

Filed Nov. 22, 1982, Ser. No. 443,643
Claims priority, application France, Nov. 20, 1981, 81 21932
Int. Cl.³ F16L *55/12*
U.S. Cl. 138—93 **10 Claims**



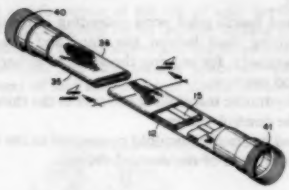
1. An expandable device having a flexible and elastic expandable hose that is reinforced by at least two reinforcement plies made of flexible metal cables and that is secured at at least one end of the device by the reinforcement plies being locked by rigid closure means, said closure means comprising a sealed bottom closure element for closing the one end of the hose, and inner support element and an outer reinforcement element, said inner and outer elements being coaxial and the inner support element being secured to the sealed bottom closure; said support and reinforcement elements having conical locking surfaces which diverge towards the one end of the device and a wedge arranged between end edges of the reinforcing plies to lock the plies against, respectively, the support element and the reinforcement element.

4,467,837

LINED HOSE INCLUDING A THERMOPLASTIC LINER BONDED TO A CASING BY HOT MELT ADHESIVE

Richard L. Baker, Ashland, Ohio, assignor to Applied Polymer Technology, Incorporated, Palmetto, Fla.

Filed Jul. 22, 1981, Ser. No. 286,004
The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.
Int. Cl.³ F16L *11/12*
U.S. Cl. 138—119 **21 Claims**



1. A lined hose assembly comprising a length of flexible tubular liner, a flexible hose casing containing said tubular liner, and a hot melt adhesive in a longitudinal bead between said liner and said casing to bond a portion of said liner to a corresponding portion of said casing, said hot melt adhesive being selected from the group consisting of:

(a) a hot melt adhesive comprising from about 10 to about 60 percent-by-weight of a polyether-based thermoplastic polyurethane and about 40 to about 90 percent-by-weight of polymeric fat acid polyamide;

(B) a hot melt adhesive comprising from about 10 to about 25 percent-by-weight of a polyether-based thermoplastic polyurethane, up to about 50 percent-by-weight of a polymeric fat acid polyamide, and from about 25 to about 90 percent-by-weight of a thermoplastic copolyester; and

(C) a hot melt adhesive comprising from about 10 to about 60 percent-by-weight of a polyether based thermoplastic polyurethane, up to about 90 percent-by-weight of a polymeric fat acid polyamide, and up to about 75 percent-by-weight of a polyester polyamide.

17. A lined hose assembly for carrying fluid under pressure comprising a length of circumferentially uniform flexible tubular liner, a flexible circumferentially uniform hose casing containing said tubular liner, a first portion of said tubular liner being pressed into tight engagement with a portion of the interior of said casing upon admission of fluid under pressure into said liner, and a hot melt adhesive in a narrow longitudinal bead between said liner and said casing bonding a second portion of said liner to a corresponding portion of said casing.

4,467,838

APPARATUS AND PROCESS FOR PRODUCING WOVEN, NON-LINEAR SHAPES FROM GRAPHITE FABRIC, AND THE LIKE, AND PRODUCTS PRODUCED THEREFROM

Walter A. Rheaume, Fullerton, Calif., assignor to Textile Products, Incorporated, Anaheim, Calif.

Filed Feb. 15, 1983, Ser. No. 466,425
Int. Cl.³ D03D *49/20, 41/00, 3/00*; B63H *11/00*
U.S. Cl. 139—305 **20 Claims**

1. A process for producing a fabric wrapping having a non-linear shape suitable for conversion into an exit cone, rocket motor, and the like, comprising the steps of:

(a) weaving a continuous, single length of fabric in a loom;

(b) continuously wrapping the fabric as it leaves the loom and onto a rotating, non-linear wind up form inclined to the loom, to produce an integral wrapped shape, the wind up form defining a conical portion, a cylindrical portion, and an interface between the conical and cylindrical portions;

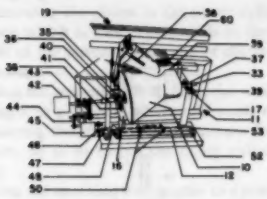
(c) tensioning, contouring and aligning the fabric during the

wrapping step by passing the fabric through adjustable contouring, tensioning and alignment roller means and bar means inclined to the loom;

(d) pressuring the contouring means onto the wrapped-up fabric to maintain a close, uniform wrapping;

(e) weaving a thicker cylindrical portion than a conical portion;

(f) offsetting the direction of fabric travel from the loom to the wind up form to compensate for the different distances of fabric travel; and,



(g) traversing the form relative to the loom for a short distance in a single pass to control the wrapping contour at the interface and produce a suitably curved interface shape; whereby, the wrapped fabric shape has the property of being adapted for:

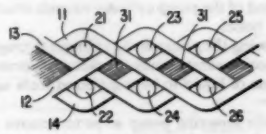
(i) impregnating with resin; (ii) curing the resin; (iii) removal of the resin-impregnated, cured fabric from the wind up form; (iv) trimming and machining the cured fabric to produce a uniformly curved exit cone having a curved interface; and (v) providing internal threads in the cylindrical portion.

4,467,839

PAPERMAKERS FABRIC USING DIFFERENTIAL MELT YARNS

William T. Westhead, Waycross, Ga., assignor to Scapa Inc., Waycross, Ga.

Filed Apr. 28, 1981, Ser. No. 258,046
Int. Cl.³ D03D *25/00*
U.S. Cl. 139—383 A **18 Claims**



8. A papermakers fabric comprising:

a first layer defined by a first plurality of weft yarns;

a second layer defined by a second plurality of weft yarns;

a plurality of warp yarns interwoven with said weft yarns to define a first surface of said first layer, a second surface of said second layer, and a plurality of stuffer pick receiving sheds interposed between said first and second layers; and

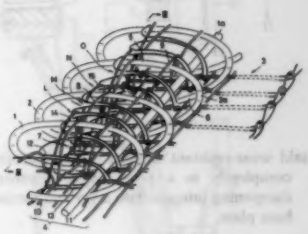
a plurality of stuffer picks, each of said stuffer picks being made of a synthetic material having a melting point lower than the alteration temperature of any of the remaining yarns of said fabric, said stuffer picks having been melted to flow around and between unmelted yarns and reformed within said fabric for controlling permeability, said reformed picks being bonded and locked to unmelted yarns for enhanced fabric stability, and said unmelted yarns being unchanged by the melting of said stuffer picks.

4,467,840

WOVEN SLIDE FASTENER STRINGER AND APPARATUS FOR MANUFACTURING THE SAME

Noritaka Tsubata, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,382
Claims priority, application Japan, Dec. 18, 1980, 55-179485
Int. Cl.³ D03D *1/00*; A44B *19/34*
U.S. Cl. 139—384 B **5 Claims**



1. A woven slide fastener stringer comprising:

(a) a woven stringer tape having a longitudinal edge portion including a first weft thread having a plurality of first loops disposed along said longitudinal edge portion;

(b) a row of continuous filamentary coupling elements disposed on said longitudinal edge portion and spaced longitudinally from each other, each of said coupling elements including a coupling head projecting transversely beyond said longitudinal edge portion and a pair of first and second legs extending from said coupling head and spaced from each other in a direction substantially perpendicular to the plane of said longitudinal edge portion, said first legs being mounted on said longitudinal edge portion; and

(c) a binding thread system fixing said rows of continuous filamentary coupling elements and including at least a pair of warp threads disposed adjacent to said coupling heads and alternately overlying and underlying said first and second legs of the coupling elements in symmetrical relation substantially with respect to the plane of the longitudinal edge portion, said pair of warp threads having loops interlaced with said first loops of the first weft thread of the longitudinal edge portion adjacent to said first legs, and a second weft thread having a plurality of second loops arranged longitudinally of said binding thread system and interlaced with said loops of said pair of warp threads adjacent to said second legs.

4,467,841

CLAMPING JAW ARRANGEMENT OF A THREAD CLAMP FOR TEXTILE YARNS OR THE LIKE

Rudolf Zwiener, Arbon, Switzerland, assignor to Aktiengesellschaft Adolf Saurer, Arbon, Switzerland

Continuation-in-part of Ser. No. 183,085, Sep. 2, 1980,. This application Jan. 31, 1983, Ser. No. 462,429
Int. Cl.³ D03D *47/00*
U.S. Cl. 139—429 **3 Claims**

1. A clamping jaw arrangement for a thread clamp for textile yarns or the like, comprising:

two clamping jaw supports;

means for mounting said two clamping jaw supports for relative movement towards and away from one another;

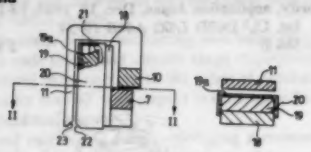
a clamping jaw formed at each of said clamping jaw supports:

at least one of the clamping jaws comprises a wear-resistant support element, a block-shaped intermediate layer and a base plate;

said block-shaped intermediate layer being formed of elastomeric material fixedly connected by said base plate with said one of the clamping jaw supports and providing an

oscillation dampening element for said one clamping jaw support;

said wear-resistant support element being mounted in straddling fashion to surround said block-shaped intermediate layer and being fitted for guidance around said base plate; and



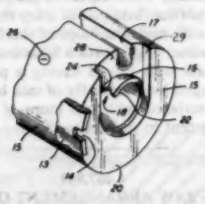
said wear-resistant support element protectively enclosing completely in a hood-shaped manner said oscillation dampening intermediate layer and partially enclosing said base plate.

4,467,842

MAGNET WIRE WRAPPING BIT

Clifford L. Galloup, Reed City, and Roger M. Bula, Big Rapids, both of Mich., assignors to Cooper Industries, Inc., Houston, Tex.

Filed May 2, 1983, Ser. No. 490,670
Int. Cl.³ B21F *3/00*
U.S. Cl. 140—124 **16 Claims**



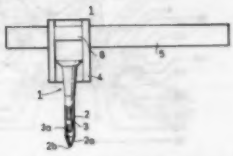
1. In a device for stripping insulation from wire and wrapping said stripped wire around a terminal in a series of helical convolutions wherein the device includes a rotatable wrapping bit having a wire receiving groove disposed on the periphery of the bit and radially offset from a terminal receiving bore in said bit at the end thereof and a fixed sleeve surrounding said bit with a wire anchoring slot extending outwardly therefrom, the improvement wherein said bit includes an adjustable insert having a free end and a portion within said bit surrounding and defining the terminal receiving bore, said insert having a hook shaped insulation stripping edge protruding beyond a surface of said bit and positioned axially inward of the free end of said insert, radially inwardly of said groove and angularly positioned between said groove and said anchoring slot, the angular position being adjustable by rotating said insert within said bit and thereby controlling the tension of said wire as it moves over said hook, a portion of the radius of the hook surface substantially matching the radius of the wire.

4,467,843

METHOD OF OPERATING A METERING APPARATUS FOR LIQUID

Richard Holmqvist, Bromma; Erling Berglund, Järfälla, and Göran Högberg, Bromma, all of Sweden, assignors to Clinicon AB, Bromma, Sweden

Filed Oct. 29, 1981, Ser. No. 316,399
Claims priority, application Sweden, Nov. 18, 1980, 8008086
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **2 Claims**



1. A method of operating a metering apparatus for transferring accurately determined volumes of liquids successively from a number of first vessels containing said liquids to respective ones of a number of second vessels, said apparatus comprising:

a metering pump including a pump cylinder which tapers to a point at one end thereof and which has an opening arranged in said pointed end,

a piston arranged for axial movement within said cylinder while sealing against the internal surface of the cylinder and having a maximum terminal position of forward displacement at said end of said cylinder, in which forward terminal position of the piston the cylinder volume communicating with said opening in said pointed end of the pump cylinder is zero,

means for accurately controlling the axial movement of the piston in the cylinder, to enable the cylinder volume communicating with said opening to be varied,

means for moving the metering pump horizontally, and

means for moving said pump vertically;

said method comprising the operational steps of

(a) moving the metering pump to a position above one of said first vessels, and lowering the pump so that said pointed end of the pump cylinder extends into the liquid of said first vessel;

(b) withdrawing the piston in the cylinder through a distance which exceeds substantially the distance corresponding to the volume of liquid to be transferred from said first vessel;

(c) raising the metering pump so as to remove the pointed end of the pump cylinder to a position above the surface of the liquid in said first vessel;

(d) advancing the piston in the pump cylinder so that part of the amount of liquid drawn into the pump cylinder in step (b) is returned to said first vessel;

(e) immediately withdrawing the piston through a short distance in the pump cylinder, so that any droplets which may remain on the pointed end of the pump cylinder subsequent to step (d) is or are withdrawn into the pump cylinder;

(f) moving the metering pump to a position above one of said second vessels;

(g) advancing the piston in the pump cylinder through a distance equal to the sum of a distance corresponding to said given volume of liquid to be transferred and the distance through which the piston was withdrawn in step (e);

(h) immediately withdrawing the piston in the pump cylinder through a short distance, so that any liquid droplets

remaining on the pointed end of the pump cylinder subsequent to step (g) are drawn into the pump cylinder;

(i) moving the metering pump to a position above a waste outlet;

(j) advancing the piston to its maximum forward terminal position, so as to empty the pump cylinder of liquid present therein;

(k) moving the metering pump to a position above a vessel containing a washing liquid and lowering the pump until the pointed end of the pump cylinder extends into said washing liquid;

(l) withdrawing the piston in the pump cylinder through a distance which at least corresponds to the maximal withdrawal of the piston during any of the preceding operational steps;

(m) raising the metering pump from the washing liquid and moving it to a position above said waste outlet;

(n) advancing the piston to its maximum forward terminal position, so as to empty the pump cylinder of washing liquid;

(c) moving the metering pump again to a position above said vessel containing said washing liquid and lowering it so that the pointed end of the pump cylinder extends into the washing liquid.

(p) again raising the metering pump slowly, so that the pointed end of the pump cylinder is drawn out of the washing liquid without entraining a liquid droplet therewith; and

thereafter repeating steps (a)–(h) with respect to liquid to be transferred from another one of said first vessel to a respective other one of said second vessels.

4,467,844

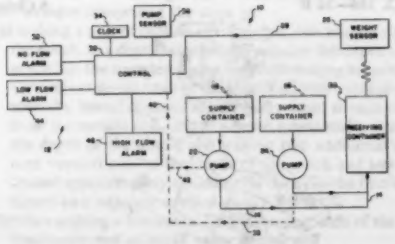
FLOW MONITORING METHOD AND APPARATUS

Aleandro Di Gianfilippo, Arlington Heights, and Alan A. Figler, Algonquin, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 24, 1982, Ser. No. 391,758

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—1 **24 Claims**



14. A method for precisely monitoring fluid transfer of a predetermined amount from at least one fluid source, to a fluid receiving container, by motive means, comprising:

detecting a first base weight of said receiving container at a first instant of time and detecting a second weight of said receiving container at a second instant of time later than said first instant of time;

comparing said first and second weights; and

activating an alarm when said second weight is not greater than said first weight, thereby indicating lack of fluid flow from said fluid source to said receiving container.

4,467,845

METHOD AND MEANS FOR FILLING OF BULK MATERIAL IN FLEXIBLE CONTAINERS

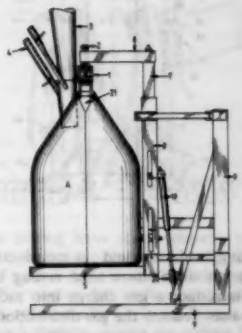
Olaf Strand, and Olav Skyllingstad, both of Porsgrunn, Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Apr. 13, 1982, Ser. No. 367,979

Claims priority, application Norway, Apr. 30, 1981, 811673

Int. Cl.³ B65B *1/04*

U.S. Cl. 141—10 **13 Claims**



1. A method of filling bulk material into a flexible container of the type having at least one upper lifting loop by which the container may be lifted, said method comprising:

supporting said lifting loop by a load carrying double hook, while supporting the bottom of said container by a generally planar supporting member;

introducing air into the interior of said container, thereby blowing up said container;

filling bulk material into said interior of said container, while supporting a substantial portion of the weight thereof by said hook, thereby maintaining said lifting loop taunt during filling;

upon completion of said filling, simultaneously lowering said hook and said supporting member, while moving said supporting member laterally;

inserting an external lever through said lifting loop; and

opening and removing said hook, whereby said lifting loop is supported by said external lever.

4,467,846

BOTTLE FILLING DEVICE

Brian J. Croser, Piccadilly, Australia, assignor to Oenotec Pty. Limited, Unley, Australia

Filed Aug. 4, 1982, Ser. No. 405,090

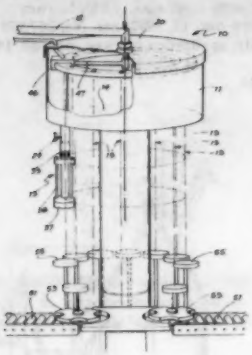
Claims priority, application Australia, Aug. 12, 1981, PF0187/81

Int. Cl.³ B65B *31/04*

U.S. Cl. 141—47 **8 Claims**

1. A bottle filling device comprising a rotatable liquid reservoir, a plurality of filling heads connected to the base of the reservoir and rotatable therewith to each move between first and second filling stations, each filling head being engageable with a bottle at the first filling station, and disengagable therewith at the second filling station, each filling head having a first tube terminating below the level of the liquid in the reservoir and a second tube extending above the level of the liquid in the reservoir, valve means at the lower ends of the first and second tubes adapted to open the first and second tubes at or after the first filling station and to close them at or before the second filling station, and gas introduction means adapted to force a blast of gas down the second tube at the first filling station or intermediate the first and second filling stations to remove any liquid therefrom and to allow gas displaced by the filling of the bottle to be vented upwardly through the second tube until the

liquid in the bottle rises to the level of the lower end of the second tube, each of said second tubes having an upper end that opens into a planar annular ring which is adapted to rotate



with the filling heads, and said gas introduction means having a stationary gas distribution head resting on said ring and adapted to introduce a gas charge into each of said second tubes as it passes beneath the gas distribution head.

4,467,847

MACHINE FOR LABELING AND/OR FILLING BOTTLES ALONG TWO PATHS

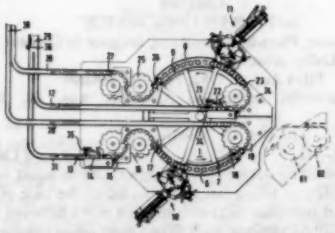
Rudolf Zodrow, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 7, 1982, Ser. No. 386,161

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124032

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—98 **10 Claims**



1. In a processing machine comprising a plurality of work stations disposed in a peripheral work area about a turntable, said turntable having at least two arcuate transport path sections wherein said transport path sections have transfer means disposed at points of entrance and exit of the transport path sections, and infeed and outfeed conveyors leading to said transfer means, the improvement comprising disposing the infeed conveyor associated with a first of said arcuate transport path sections and the outfeed conveyor associated with a second of said arcuate transport sections substantially parallel to one another and crossing over the center of said turntable inside the peripheral work area of said work stations.

4,467,848

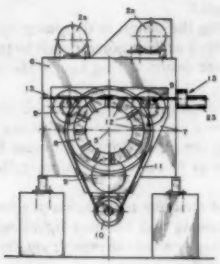
MACHINE FOR CUTTING DOWN LOGS TO A DESIRED DIAMETER

Ludwig Schmid, Altötting, Fed. Rep. of Germany, assignor to Maschinenfabrik Esterer AG, Altötting, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,384

Int. Cl.³ B27C *5/08*

U.S. Cl. 144—4 **6 Claims**



1. A log shaping machine for cutting logs to desired diameter, said machine comprising:

means for guiding a log to be shaped longitudinally along a center line through the machine;

a cutting ring mounted for rotation about the line of guiding of the log;

a driving unit coupled to and rotating said ring;

cutting tools on said ring engageable with the log;

a gyratory frame supporting said cutting ring for selective displacement of the ring and its axis of rotation with respect to the line of guiding of the log, means driving said frame in a gyration motion, whereby the effective cutting path of said cutting tools with respect to the log is changed.

4,467,849

FELLING HEAD

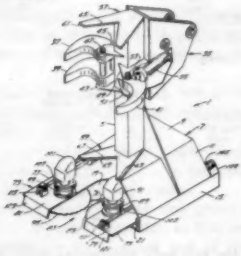
Jean Denis, 623 Grand 5, Ste. Rosalie, Quebec, Canada J0H 1X0

Filed May 28, 1982, Ser. No. 383,275

Claims priority, application Canada, Apr. 13, 1982, 400835

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—34 R **5 Claims**



1. A felling head for use in harvesting a stand of trees, the felling head having: means to position a tree to be cut; saw mounting means beneath the positioning means; a saw-carrying member movably mounted on the saw mounting means; the saw-carrying member having a pair of forwardly directed legs spaced apart to define a tree receiving slot therebetween; a circular saw mounted on the inner side of each leg and extending halfway into the slot to lie adjacent the other saw; means

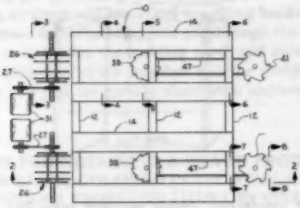
for rotating each saw; means for moving the saw-carrying member forwardly of the saw mounting means to saw through a tree positioned in the slot with both saws; each saw having a diameter generally half the diameter of the smallest single saw that would be needed to saw the same trees in the stand.

4,467,850

MACHINE FOR CUTTING ROUNDED CORNER NOTCHES

Thomas O. Mills, 219 N. Maple, Douglass, Kans. 67039

Filed Mar. 8, 1982, Ser. No. 355,987
Int. Cl.³ B27C *5/00*
U.S. Cl. 144—368 **7 Claims**



1. A machine for cutting a rounded corner in a pallet stringer notch comprising:

a first stage cutting means including at least two vertically positioned, laterally spaced saw blades, an outside blade having a shorter radius than an adjacent blade by a distance substantially equal to the lateral spacing between said two blades; and

a second stage cutting means following the first stage cutting means and including a horizontally positioned saw blade, with a downwardly extending arbor, positioned to intersect the end of the cut of said adjacent blade and cut away a portion of the stringer notch; and

a third stage cutting means following the second stage cutting means and including a horizontally positioned radius cutter, with a downwardly extending arbor, positioned to intersect the end of the vertical cut of the adjacent blade perpendicularly and intersect the end of the vertical cut of the outside blade tangentially to form the rounded corner of the stringer notch.

5. A method for forming a notch with rounded corners in a pallet stringer comprising the steps of:

(a) making a pair of outside vertical cuts, one at each side of the notch, to a depth substantially equal to the depth of the notch less the rounded corner's radius; making an adjacent vertical cut inside each of the pair of outside vertical cuts, spaced a lateral distance substantially equal to said radius from the outside cuts, and to a depth substantially equal to the depth of the notch; and making two additional adjacent vertical cuts to the depth of the notch and laterally spaced approximately equidistantly between the first-mentioned two adjacent vertical cuts;

(b) then making a horizontal cut connecting ends of the two first-mentioned adjacent vertical cuts; and

(c) then making a radius cut forming the rounded corners of the notch, tangential to and connecting ends of the horizontal cut with ends of the pair of outside vertical cuts.

4,467,851

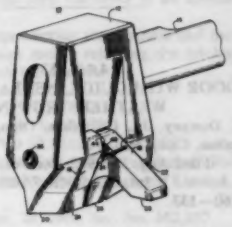
SPLITTING DEVICE

Mark E. Hockman, 672 Mount Rd., Aston, Pa. 19014

Division of Ser. No. 182,149, Aug. 28, 1980, Pat. No. 4,383,562.
This application Apr. 21, 1983, Ser. No. 487,090
Int. Cl.³ B26B *23/00*
U.S. Cl. 145—2 R **7 Claims**

1. A device for splitting objects comprising a head portion having a cutting edge with two pivoting means on the head portion characterized in

that each pivoting means has a cutting lever and a thrust lever, each cutting lever has a cutting lever edge, the cutting lever edges and the head portion cutting edge form a substantially single cutting edge, the thrust lever is substantially displaced from the cutting lever edge by way of a void formed in the pivoting means between the thrust



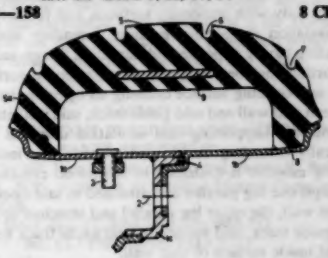
lever and the cutting lever edge, whereby upon being thrust against an object the cutting lever edges and cutting edge form and enter a crack simultaneously and the thrust levers thereafter contact the surface of the object, each thrust lever is substantially displaced from a respective wall of the crack thereby causing the cutting lever edges to rotate outwardly substantially deep within the crack to provide splitting.

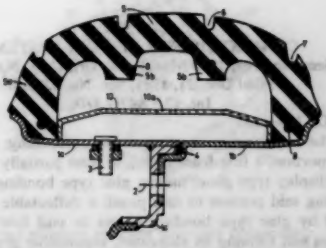
4,467,852

TIRE FOR LORRIES

Jakob Ippen, Leverkusen, and Friedel Stüttgen, Pulheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 16, 1982, Ser. No. 418,748
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138582
Int. Cl.³ B60C *3/00, 17/04*
U.S. Cl. 152—158 **8 Claims**





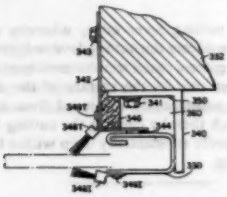
1. A pneumatic tire and a tire rim with side flanges out-

wardly extending therefrom, the tire having an air filled hollow cavity and having no carcass reinforcing elements, characterized in that the height to width ratio thereof is from 0.3 to 0.5:1, the transverse radius of curvature thereof is from 0.9 to 1.1 times the tire width, and the thickness of each tire side wall at the height of the rim flange is from 12 to 20% of the tire width.

4,467,853
DOOR WITH GUIDE INSULATION AND WEATHERSTRIPPING

Robert C. Downey, Jr., Columbus, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.

Filed Aug. 20, 1982, Ser. No. 409,872
Int. Cl.³ E06B 7/098
U.S. Cl. 160—133 **8 Claims**



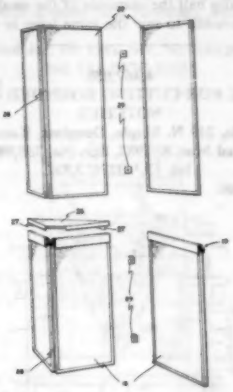
1. A door comprising a plurality of slats connected for relative pivoting between adjacent slats, said slats mounted for movement along a vertical guide track, said guide track mounted on a mounting flange projecting out from an inside surface of a wall and having a vertically extending cavity between said inside surface of said wall and said guide track and bounded by said mounting flange; and insulation disposed in said vertically extending cavity, and insulation being in contact only with stationary surfaces, and further comprising an insulation supporting member bounding said vertically extending cavity opposite said mounting flange, said insulation supporting member mounted to an opening surface of said wall, said opening surface defining an opening, and extending between said wall and said guide track, said insulation supporting member supporting said insulation disposed within said vertically extending cavity, and wherein said insulation supporting member is L-shaped in horizontal cross-section with two legs, one leg parallel and attached to said opening surface of said wall, the other leg parallel and attached to a surface of said guide track, said surface of said guide track being parallel to said inside surface of said wall.

4,467,854
CONNECTOR FOR DISPLAY SYSTEMS

H. Glenn Godfrey, 1005 Manchester Dr., Cary, N.C. 27511

Filed Dec. 21, 1981, Ser. No. 332,667
Int. Cl.³ A47G 5/00
U.S. Cl. 160—135 **1 Claim**

1. An improved connecting means comprising: a relatively rigid portion; a first foam cored, at least partially fabric covered display type panel means; glue type bonding means for securing said portion to said panel; a deflectable portion secured by glue type bonding means to said first mentioned portion and forming an elongated, expandable groove; a second foam cored, at least partially fabric covered display type panel means adapted to be snugly inserted into said expandable groove; and shelf-like accessory means including a vertical tab means for insertion into said expandable groove whereby an

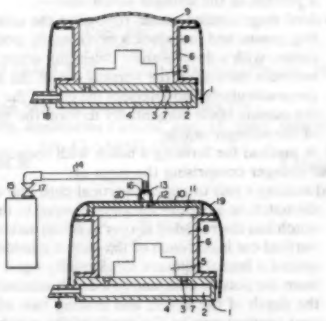


improved connecting means between panel-like members is provided.

4,467,855
METHOD OF MAKING MOLD

Nagato Uzaki, Toyohashi; Toshihisa Komori, Toyokawa; Kazuharu Matui, Toyokawa, and Shigehiro Toyoda, Toyokawa, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed Nov. 12, 1981, Ser. No. 320,694
Int. Cl.³ B22C 15/00, 9/12
U.S. Cl. 164—7.1 **1 Claim**



1. A method for making a mold comprising the steps of:
charging molding sand containing a gas-hardenable binder, into a space defined between a molding flask and a pattern plate, said molding flask having a top, outer lateral surfaces and bottom, said pattern plate having vent holes therethrough and a portion for mating with said bottom of said flask defining a parting plane therebetween;
stretching a flim sheet so as to gas-tightly cover all of the extent from the top of the charged molding sand to the mating portion between the bottom of the molding flask and the pattern plate including the top and the outer lateral surface of the flask, the film sheet extending past the parting plane;
evacuating the air from said space through the vent holes in the pattern plate so that the film sheet uniformly squeezes and compacts the molding sand while sealing the molding flask down to and past the parting plane from ambient air;

removing said film sheet;
placing a cover member on the top of the molding flask, said cover member having a top and a gas supply port adapted to supply therethrough a hardening gas from a hardening gas generating device to said space;
stretching another film sheet so as to gas-tightly cover all of the extent between the top of the cover member to the mating portion between the molding flask and the pattern plate including the top of the cover member and the outer lateral surfaces of the flask, said another film sheet extending past the parting plane;
placing a cap on said another film sheet on said cover member so as to cover said gas supply port, said cap having a hole through which said cap is communicated with said hardening gas generating device; and
evacuating air from said space and supplying hardening gas to said space for influencing said gas through the molding sand so as to harden the molding sand, said another film sheet sealing said cover member and the molding flask down to and past the parting plane from ambient air.

4,467,856

PROCESS FOR OBTAINING A SILVER PRODUCT WHICH IS BLACK-COLORED IN ITS WHOLE MASS AND SILVER PRODUCTS THUS OBTAINED

Lucien Vachey, 45, avenue des Ternes, Paris 75017, France

Filed Nov. 8, 1982, Ser. No. 439,983
Claims priority, application France, Nov. 19, 1981, 81 21701
Int. Cl.³ B22D *25/00*
U.S. Cl. 164—47 **10 Claims**

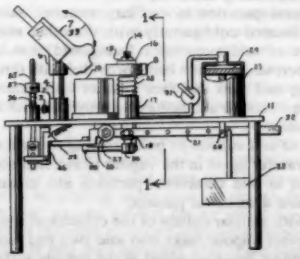
1. A process for the preparation of a silver product, black-coloured in its whole mass, comprising the step of closely contacting silver with sulfur or with a compound containing sulfur or able to generate sulfur until complete oxidation of the silver, said process further comprising the steps of:
reducing into powder the black silver thus obtained;
melting said powder;
casting the molten silver into a mould; and
cooling the moulded product thus obtained until complete solidification thereof.

4,467,857

CASTING APPARATUS

Lewis E. Massie, 2218-13th St., Olivenhain, Calif. 92024

Filed Sep. 30, 1982, Ser. No. 428,876
Int. Cl.³ B22D *18/06*
U.S. Cl. 164—253 **1 Claim**



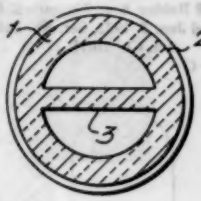
1. In a casting apparatus of the type comprising a base, a mold mounted on the base, a pouring mechanism for pouring molten metal into the mold, a pressure system at the top of the mold for applying pressure to force the molten metal into the mold, and a vacuum system at a bottom of the mold for drawing molten metal into the mold, the improvements comprising:
(a) a weighted lever coupled with the pressure system and the vacuum system, said lever being coupled to a pressure plunger of the pressure system and a vacuum pump piston of the vacuum system;
(b) means for positioning the plunger over an opening in the mold;
(c) adjustable means for regulating the rate at which the lever rotates about a pivot point;
(d) means on the lever for positioning weights along the lever;
(e) a rotatable crucible to pour molten metal into the mold;
(f) latching means to lock the lever in an upward loaded position; and
(g) linkage means connecting the crucible and the latching means, said linkage means releasing the latching means upon contact with the crucible.

4,467,858

BLIND FEEDER SLEEVES

Gerd Trinkl, and Helmut Schopp, both of Borken, Fed. Rep. of Germany, assignors to Foseco International Limited, Birmingham, England

Filed Mar. 26, 1982, Ser. No. 362,107
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 8110973[U]
Int. Cl.³ B22C *9/08*
U.S. Cl. 164—360 **16 Claims**



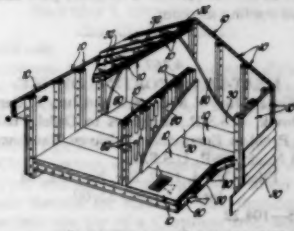
1. A blind feeder sleeve comprising a sleeve body and a cover and having a gas-permeable core, the gas-permeable core being formed integrally with the feeder sleeve, and wherein the gas-permeable core consists of a rib extending directly across the inner surface of the cover and projecting downwardly from that surface in a wedge like shape.

4,467,859

ENERGY EFFICIENT BUILDING STRUCTURE AND PANEL THEREFOR

Thomas J. Carroll, Birmingham, Mich., and James K. Paisley, New York, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 13, 1981, Ser. No. 253,232
Int. Cl.³ F24D *5/00*; F24J *3/02*
U.S. Cl. 165—57 **2 Claims**



1. An energy efficient building structure comprising:
a plurality of structural panels wherein each panel includes a sheathed foam core formed into an open celled unit hav-

ing a major expanse and a pair of flanges projecting from the plane of said expanse along opposite edges thereof,

means securing a flange of each panel to an adjacent flange of another panel whereby the major expanses of said panels form an insulated self-supporting section of said building structure,

covering members secured to the flanges of at least some of said panels generally parallel to the major expanses thereof to create closed cell units having air ducts therethrough,

said building structure having an air flow loop extending between said ducts and another region of said building structure and being adapted to direct a flow of air through said loop.

at least one of said closed cell units including heat transfer means for changing the temperature of air flowing through said loop in order to transfer heat to or from said region,

and wherein said sheathed foam core limits heat transfer between the panel and said air flow to rapidly transfer heat between said heat transfer means and said region.

4,467,860

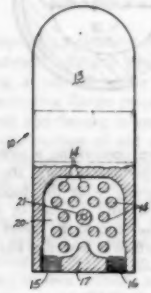
DEVICE FOR COOLING SEMI-CONDUCTORS

Alec Wargo, 1058 Rubber Ave., Naugatuck, Conn. 06770

Filed Jun. 3, 1982, Ser. No. 384,631

Int. Cl.³ H01L *23/46*

U.S. Cl. 165—80 C **9 Claims**



1. A cooler for use with semi-conductor power elements which comprises: a one-piece metal casting having an essentially planar external surface and an internal cooling chamber for receiving a cooling medium, cooling medium inlet and outlet means communicating with said chamber for ingress and egress of cooling medium, and from 5 to 25 substantially round cooling pins within said chamber, wherein said pins are spaced 0.15 to 0.3" from each other and all of said pins have a diameter of from 0.15 to 0.5" to provide a tortuous path and turbulent flow for said cooling medium.

4,467,861

HEAT-TRANSPORTING DEVICE

Valery M. Kiseev; Jury F. Maidanik, and Jury F. Gerasimov, all of Sverdlovsk, U.S.S.R., assignors to Otdel Fiziko-Tekhnicheskikh Problem Energetiki Uralskogo Nauchnogo Tsentra Akademii Nauk SSSR, U.S.S.R.

Filed Oct. 4, 1982, Ser. No. 432,788

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—104.22 **1 Claim**

1. A heat-transporting device comprising:

an evaporating chamber evaporated wherein is a heat-transfer agent;

an evaporator in a capillary material soaked with said heat-transfer agent, said evaporator being in thermal contact with a source of heat and being arranged in said evaporating chamber coaxially therewith;

an axial bore provided in said evaporator to feed the heat-transfer agent thereto;

a vapour-jet pump for transforming the dynamic pressure of the heat-transfer agent in the vapour phase into the static pressure of the heat-transfer agent in the liquid phase;

a suction side of said vapour-jet pump;

a discharge side of said vapour-jet pump;

a heat-exchanging chamber for rejecting the heat of the heat-transfer agent in the liquid phase into the surrounding medium;

a first conduit connecting a zone of said heat-exchanging chamber contained wherein is the heat-transfer agent with a lower heat content to said suction side of said vapour-jet pump;

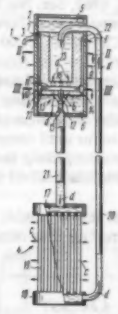
an outlet of said first conduit located in said axial bore of said evaporator;

a second conduit connecting a zone of said heat-exchanging chamber contained wherein is the heat-transfer agent with a higher heat content to said discharge side of said vapour-jet pump;

two end face cavities for the heat-transfer agent in the liquid phase, said end face cavities serving as said suction side of said vapour-jet pump;

an end face of said evaporator;

another end face surface of said evaporator;



one of said two end face cavities is bounded by an end face surface of said evaporator and walls of said evaporating chamber;

the other of said two end face cavities is bounded by the other end face surface of said evaporator and said walls of said evaporating chamber;

a transverse partition in capillary material, said partition being located contiguously with the other said end face surface of said evaporator facing said heat-exchanging chamber; said partition being provided with through holes placing said two end face cavities into communication with one another and being also provided with a diametrical passage;

a nozzle of said vapour-jet pump serving to form a jet of the heat-transfer agent in the vapour phase, said nozzle being located in said transverse partition and communicating with said diametrical passage;

two smooth annular collars of the cylindrical shape serving to prevent vapour leaks into said two end face cavities, said collars being provided at the outside surface of said evaporator next to the end faces thereof;

a vapour header provided in said partition and connect to said diametrical passage;

vapour outlets provided in the form of longitudinal grooves out in the outside surface of said evaporator, said outlets being connected to said vapour header and extending between said two smooth annular collars of the cylindrical shape.

4,467,862

DEVICE FOR PASSIVE HEAT TRANSPORT AND INTEGRATED SOLAR COLLECTOR INCORPORATING SAME

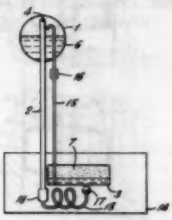
Gianfranco DeBeni, Cadrezzate, Italy, assignor to European Atomic Energy Community (Euratom), Luxembourg, Luxembourg

Division of Ser. No. 286,664, Jul. 24, 1981, abandoned. This application Nov. 12, 1982, Ser. No. 441,113

Claims priority, application United Kingdom, Aug. 7, 1980, 8025792

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—104.22 **7 Claims**



1. A device for passively transporting heat in any direction, particularly downwards, from a heat source to a heat sink, which device comprises a boiler having walls for heating a working fluid, a container for condensing vapour of the heated working fluid, means for transferring the said vapour from the boiler to the condenser, means for transferring the working fluid from the condenser to the boiler, the said working fluid being compelled from the condenser to the boiler, when the device is in use, by expansion of a compressible medium stored in the condensor, which medium is additionally compressed by the vapour of the working fluid when the device is used, said transfer means for the vapour and for the working fluid being provided with self-actuated one-way control valves and means in said boiler to prevent immediate contact between the working fluid entering the boiler and said walls of the boiler.

4,467,863

FLUE GAS DUCT ASSEMBLY

Frank J. Montana, Western Springs, Ill., assignor to Bisco Products, Inc., Park Ridge, Ill.

Filed Mar. 7, 1983, Ser. No. 472,635

Int. Cl.³ F28F *13/00*; **D03D** *49/26*

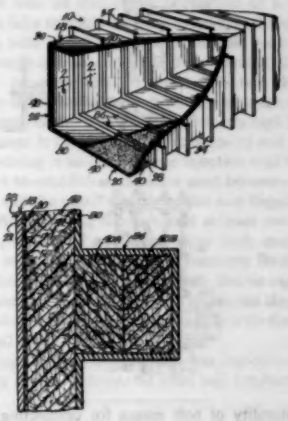
U.S. Cl. 165—136 **4 Claims**

1. A length of corrosion resistant, longitudinally extending duct assembly for flue gases from fossil fuel combustion processes and which is designed to operate at, and accommodate, the flue gas temperatures; said assembly comprising:

a metal outer support duct having an inner surface on the interior of said outer support duct; said outer support duct having a transverse cross-section inner perimeter consisting of a first portion and remaining second portion, said first portion defining a load bearing region for (1) supporting selected design loads comprising at least part of the weight of the duct assembly and of particulate matter that may settle out of the flue gases and (2) occasionally temporarily supporting other selected design dead and live loads that may be present during initial construction of said duct assembly or during subsequent inspections of the interior of said duct assembly after construction;

a spacer material substantially covering said inner surface of said outer support duct, said spacer material having an inner surface and an outer surface with the spacer material outer surface facing against the inner surface of said outer support duct, said spacer material also being secured to said inner surface of said outer support duct at least in said remaining second portion, at least said inner surface of said spacer material being movable generally parallel to said inner surface of said outer support duct under the application of relatively low shear forces imposed on the inner surface of the spacer material in directions parallel to the inner surface of said outer support duct, said spacer material being movable generally normal to said inner surface of said outer support duct under the application of relatively low compression forces imposed on the inner surface of the spacer material in directions normal to the inner surface of said outer support duct at least where said spacer material covers said outer support duct second portion; and

a substantially gas-tight, fiberglass reinforced polyester liner disposed against the interior perimeter of said inner surface of said spacer material, said liner being spaced from



said outer support duct inner surface by said spacer material but otherwise being in general conformity with said outer support duct inner surface, said liner having sufficient thickness and rigidity to self-maintain the liner in said general conformity with said outer support duct inner surface, said liner further defining a plurality of corrugation means extending generally transversely of said liner at longitudinally spaced locations along the length of the liner for accommodating longitudinal thermal expansion of the liner by bellows-like elastic deformation and for functioning as rigidifying stiffeners of the transverse cross section of the liner so as to resist bending forces resulting from weight loads and from gas pressure differential loads.

4,467,864

WORKOVER RIG SUPPORT APPARATUS

Wilmer W. Crist, 110 Teche Dr., Lafayette, La. 70503

Filed May 7, 1982, Ser. No. 376,129

Int. Cl.³ E21B *19/16*

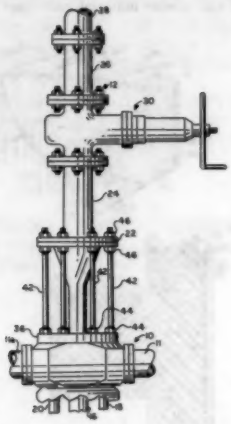
U.S. Cl. 166—96 **6 Claims**

1. An apparatus for distributing the weight of a workover rig connected to a Christmas tree over a surface of a portion of the Christmas tree to which the workover rig is attached, comprising:

A. threaded pipe joint means for connecting a workover rig to a Christmas tree, said threaded pipe joint means having an upper end and a lower end, said lower end having threads thereon for screwing said threaded pipe joint means into the top of a Christmas tree, said upper end having flange means thereon for connecting said upper end to a workover rig, said flange means having a top side and a bottom side, said threaded pipe joint being hollow inside,

B. plate means for distributing the weight of a workover rig over the surface of the portion of the Christmas tree to which the workover rig is attached, said plate means being connectable to said threaded pipe joint means and adapted to be placed upon the top of the portion of said Christmas tree to which the workover rig is attached, said plate means having a large hole in the center thereof through which said lower end of said threaded pipe joint extends, said plate means have a plurality of smaller holes therein for receipt of bolt means,

C. support means connectable to said plate means and to said threaded pipe joint means, said support means including



i. a plurality of bolt means for connecting said flange means on said upper end of said threaded pipe joint means to a workover rig and to said plate means, said bolt means having threads on the upper end thereof for receipt of nut means,

ii. nut means connectable to said upper end of said bolt means beneath said bottom side of said flange means for applying an upward force to said flange means,

iii. means connectable to the lower end of said bolt means for applying a downward force on said plate means.

4,467,865

WELL PACKER PROVIDED WITH DUAL METHODS OF USE

Mark Hardymon, 7981 Perry Rd., Delaware, Ohio 43015

Filed Apr. 1, 1983, Ser. No. 481,133

Int. Cl.³ E21B *33/124*

U.S. Cl. 166—102 **6 Claims**

1. An oil well packer comprising:

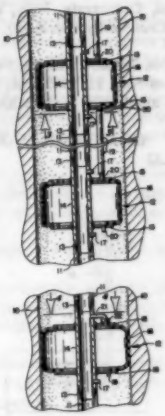
a production casing section provided with threaded ends,

two, spaced, flat, disc-shaped, circular restraining means surrounding and attached to said production casing section and extending at right angles from said production casing section,

a hollow, flexible, cylindrical member attached to the periphery of each of said restraining means and spaced from and surrounding said production casing section,

a first removable means for providing at least one opening into said production casing section on the surface thereof when said first removable means is removed from said production casing section, and

a second removable means for providing at least one opening through at least one of said restraining means into said



hollow, flexible cylindrical member when said second removable means is removed from said restraining means.

4,467,866

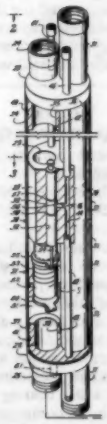
FLOW CONTROLLING APPARATUS

Gonzalo Vazquez, and Neil H. Akkerman, both of Houston, Tex., assignors to AVA International, Inc., Houston, Tex.

Filed Mar. 17, 1982, Ser. No. 358,128

Int. Cl.³ E21B *23/03, 43/12*

U.S. Cl. 166—117.5 **36 Claims**



1. Apparatus for use in controlling flow within one or more of a pair of well tubing strings adapted to be suspended from the head of the well and the annulus about the strings, comprising a mandrel having axially aligned openings through its upper and lower ends adapted to be connected with one of the pipe strings, whereby it may be lowered into the well bore, and an intermediate section whose outer diameter is eccentric to the axes of the end openings, said intermediate section of the mandrel having a first bore therethrough in substantial axial alignment with the end openings so as to form a continuation of the one string, and a second bore parallel to the first bore and extending entirely through the upper and lower ends of the

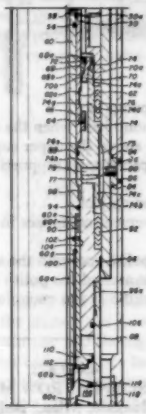
mandrel to receive the other pipe string for vertical movement with respect to the one string, said intermediate section of the mandrel also having a pocket to one side of and substantially parallel to each of the bores and having an end opening to the first bore through which a flow controlling tool may be run on a wired line through said one tubing string and first bore into and out of a landed position within the pocket.

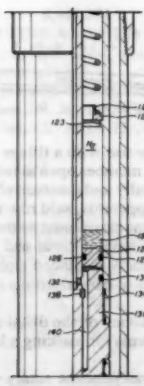
4,467,867

SUBTERRANEAN WELL SAFETY VALVE WITH REFERENCE PRESSURE CHAMBER

John R. Baker, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Jul. 6, 1982, Ser. No. 395,233
Int. Cl.³ E21B *34/08*
U.S. Cl. 166—188 **28 Claims**





1. In a subterranean well tool having a shiftable member, reciprocal in response to a force differential between opposite surfaces of said shiftable member, the force on one surface of said shiftable member comprising a force generated by the pressure of a gas; the improvement comprising a barrier fluid relatively impervious to the passage therethrough of the gas, said barrier fluid being located between said gas and a region at a pressure differing from the pressure of said gas, said barrier fluid being at a pressure in excess of said reference pressure to retard passage of said gas into said barrier fluid.

4,467,868

ENHANCED OIL RECOVERY BY A MISCIBILITY ENHANCING PROCESS

Ion Adamache, Calgary, Canada, assignor to Canterra Energy Ltd., Canada

Continuation-in-part of Ser. No. 192,563, Sep. 30, 1980, abandoned. This application Mar. 3, 1982, Ser. No. 354,475
Claims priority, application Canada, Oct. 5, 1979, 337091
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—263 **9 Claims**

1. A process for enhancing oil recovery from an underground oil reservoir in which a conditionally miscible recovery fluid injected through at least one injection well displaces oil from said reservoir to a production well which comprises:

(a) injecting into said reservoir through said at least one injection well an initial slug comprised of a first fluid which is fully miscible with the reservoir oil and which is miscible with said conditionally miscible recovery fluid over a range of concentrations from about 20% first fluid—80% recovery fluid to about 80% first fluid—20% recovery fluid, the viscosity difference between said reservoir oil and the first fluid being sufficiently high for fingering to occur in the absence of inhibition of said fingering;

(b) then shutting in said at least one injection well for at least two days to establish a transition zone between the reservoir oil and the initial slug to inhibit said fingering;

(c) thereafter injecting through said at least one injection well a plurality of additional slugs each comprising a mixture of the first fluid and the recovery fluid, the concentration of first fluid progressively decreasing from the first to the last of said plurality of additional slugs, the last of said slugs being completely miscible with the recovery fluid; and then

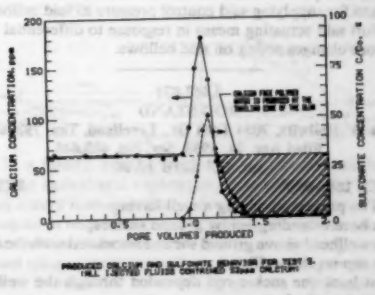
(d) injecting through said at least one injection well said recovery fluid to recover oil from said production well.

4,467,869

METHOD TO REDUCE SULFONATE LOSS IN MICELLAR FLOODING

Surendra P. Gupta, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 248,740, Mar. 30, 1981, abandoned. This application Mar. 24, 1983, Ser. No. 478,563
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—273 **13 Claims**



13. Method of improved oil recovery from an underground oil formation having an ion exchange capacity and which is penetrated by injection and production wells comprising:

(a) injecting a bank of aqueous micellar fluid into the formation, and

(b) injecting a bank of mobility control fluid into the formation, wherein the mobility control fluid has a salt level lower than or equal to the salt level of the micellar fluid, and the mobility control fluid has a greater divalent ca-

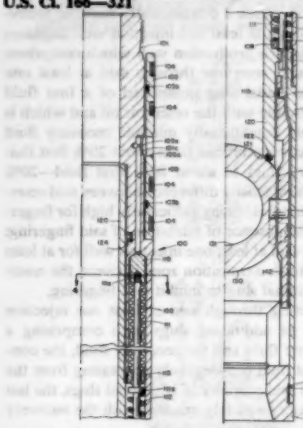
tion-to-monovalent cation ratio than the micellar fluid in order to reduce surfactant loss.

4,467,870

FLUID PRESSURE ACTUATOR FOR SUBTERRANEAN WELL APPARATUS

Ronald F. Langham, Tulsa, Okla., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Jul. 6, 1982, Ser. No. 395,544
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—321 **16 Claims**



1. A valve for use in controlling the flow through a fluid transmission conduit in a subterranean oil or gas well in response to changes in a control pressure, comprising:

a valve housing having a bore communicating with the fluid transmission conduit;

a shiftable valve closure member for opening and closing the valve bore;

actuating means for shifting the valve closure member between open and closed positions in response to differential changes in a supplied control fluid pressure and the well fluid pressure below said valve closure member comprising an expandable and contractable bellows exposed to said control pressure on one surface, said bellows supporting said pressure differential thereacross; and

means for supplying said control pressure to said bellows to shift said actuating means in response to differential pressure changes acting on said bellows.

4,467,871

ROD STAND

Curtis W. Rollwitz, 2034 Tech Dr., Levelland, Tex. 79336

Filed Apr. 11, 1983, Ser. No. 483,646
Int. Cl.³ E21B *19/00*
U.S. Cl. 166—369 **5 Claims**

1. The process involving a well having

a. a bore extending below ground surface,

b. a wellhead above ground surface associated with the bore,

c. a top on the wellhead,

d. at least one sucker rod depended through the wellhead top into the bore,

e. a polished rod at a top end of the sucker rod,

f. a pump jack connected to the polished rod for reciprocating the polished rod and the sucker rod lengthwise through the wellhead top within the bore, and

g. a clamp affixed to the polished rod above the wellhead top;

the process including

h. operating the pump jack,

i. stopping the pump jack when the clamp on the polished rod is substantially elevated above the wellhead top, then

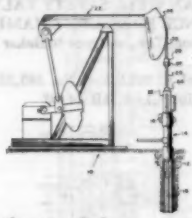
j. positioning spaced apart upper and lower supports lengthwise along the polished rod between the clamp and the wellhead top,

k. sliding the polished rod lengthwise through the spaced apart supports while

l. operating the pump jack,

m. stopping the pump jack when the lower support rests on the wellhead top and the clamp rests on the upper support, then

n. servicing the well, then



o. operating the pump jack,

p. stopping the pump jack when the clamp on the polished rod is elevated above the upper support, then

q. removing the spaced apart supports from the polished rod, then

r. operating the pump jack,

wherein the improvement comprises in combination with the above steps:

s. encircling the polish rod with the supports, thus

t. forming a girdle around the polish rod, and

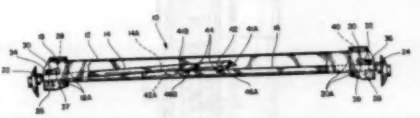
u. fastening the girdle in the encircled position around the polish rod.

4,467,872

TELESCOPING ROW MARKER

Gary D. Hodapp, Mankato, Minn., assignor to Hiniker Company, Mankato, Minn.

Filed Nov. 20, 1981, Ser. No. 323,275
Int. Cl.³ A01B *17/00*
U.S. Cl. 172—126 **13 Claims**



1. A row marker for use with a tillage apparatus having a single hollow support member open at both ends and extending generally horizontally and transversely to the direction of travel of said tillage apparatus, said row marker comprising:

first and second arms positioned within said hollow support member and having distal and proximal ends and adapted to be linearly displaced along said hollow support member so as to extend from a respective open end thereof;

marker means positioned on the distal ends of each of said first and second arms for marking a lateral displacement from a crop row;

first and second independent rotary drive means each positioned within and adjacent respective open ends of said support member and in cooperative engagement with said first and second arms, respectively, for linearly extending said arms from said support member or for retracting said arms into said support member; and

first and second hinged guides each positioned adjacent respective ends of said support member and communicating respectively with said first and second arms in providing a retaining force against said arms for maintaining said arms in cooperative engagement with said respective first and second drive means.

4,467,873
WEEDING TOOL FOR MOUNTING ON FINGERS OF USER'S HAND

Robert H. Kaatz, 6505 Parkwood Rd., Edina, Minn. 55436

Filed Dec. 9, 1982, Ser. No. 448,398
Int. Cl.³ A01B 1/16
U.S. Cl. 172—370 13 Claims

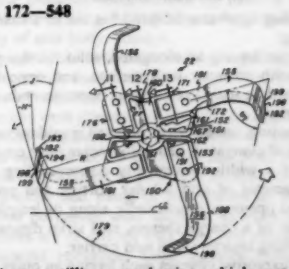
1. A weeding tool for mounting on the index and middle fingers of a user's hand comprising, an elongated flexible band having means for adjustably interconnecting its end portions to form a loop of a size adapted to encircle the first phalanges of the index and middle fingers of a user's hand, the band having a generally flat pad defining a plane, said pad being constructed of resilient flexible material with inner and outer side faces lying parallel to the plane of said pad, the pad having a first pad portion adapted to underlie the first phalanges of the index and middle fingers at their articulation with the metacarpal bones of the hand, the pad being substantially wider than the band and having a second pad portion extending laterally

from one edge of the band a substantial distance so as to be adapted to underlie a portion of the user's palm under the knuckles of the user's hand, and an elongated rigid probe secured at one end to the second pad portion of the pad, the probe extending from said one end through the first pad portion intermediate its inner and outer side faces and forwardly a substantial distance from the first pad portion substantially in the plane of the pad and in a direction generally perpendicular to the lengthwise dimension of the band so as to be adapted to underlie and project beyond the tip of the index finger on the user's hand.

4,467,874
TINE AND TINE AND HUB ASSEMBLY

Michael C. Wittrock, Arvada, Colo., assignor to The Eversman Mfg. Company, Denver, Colo.

Division of Ser. No. 143,609, Apr. 25, 1980, Pat. No. 4,373,590.
This application Jul. 30, 1982, Ser. No. 403,290
Int. Cl.³ A01B 33/10
U.S. Cl. 172—548 9 Claims



1. A tine on a tilling rotor having vehicle means to move the tilling rotor along the soil and means to rotate the tilling rotor about an axis of rotation to move the tilling rotor through the soil, said tine comprising:

a tine body formed from a unitary strip of flat bar stock, said tine body including an elongated shank portion having opposite, flat, outside and inside surfaces adapted to be disposed substantially perpendicular to an axis of rotation and having leading and trailing edges relative to the direction of rotary movement during tilling; and

a hoe portion forming an extension of one end of said shank portion, said hoe portion extending back at a selected trailing angle between about 25 degrees and 35 degrees from a straight right angle bend,

said hoe portion projecting laterally out and down from said shank portion at a selected laterally downsloping angle,

said hoe portion tilting down at a selected forwardly downsloping angle of about 25 degrees in relation to a line perpendicular to the longitudinal centerline of the shank portion so that its leading edge is lower than its trailing edge and the inside surface of said hoe portion is forwardly and downwardly sloped,

said hoe portion having opposite outside and inside surfaces and opposite leading and trailing edges that are extensions of said outside and inside surfaces and said leading and trailing edges, respectively, of said shank portion, the outside surface of said shank portion being opposite from the direction in which the shank portion extends relative to the hoe portion,

said hoe portion being moved through the soil in a direction opposite the direction of travel of the vehicle means to start cutting at the top of the soil and impart a forward motion to the vehicle means,

said outside surfaces of said shank portion and hoe portion being beveled along the same side of said body to form a leading cutting edge,

said shank portion being offset a selected angle to a radial line extending through the axis of rotation of said tilling rotor,

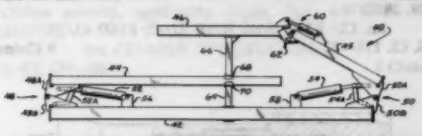
said beveled surface on said hoe portion being disposed along a selected angle of relief of about 12 degrees relative to a line tangent to a tine circle formed by the rotation of the cutting edge of said hoe portion about its axis of rotation,

said inside side surfaces of the shank and hoe portions being smooth along the same side of said tine body.

4,467,875
COMPACT, TRIPLE-HINGED AGRICULTURAL IMPLEMENT TOOL BAR

Richard A. Lewison, Pocahontas, Iowa, assignor to Ronald D. Wetherell, Cleghorn, Iowa

Filed Dec. 21, 1981, Ser. No. 332,523
Int. Cl.³ A01B 73/00
U.S. Cl. 172—776 13 Claims



13. In a folding tool bar pulled by a traction vehicle for supporting agricultural implements mounted thereon and including a main frame and first and second wing sections flexibly coupled to respective ends of said main frame wherein said wing sections are selectively movable from a working position with said wing sections generally in end-to-end alignment with said main frame and a non-working position with said wing sections displaced generally above said main frame, the improvement comprising:

hinge means incorporated in said second wing section whereby said second wing section is comprised of an intermediate member flexibly coupled to said main frame and an outer member coupled resiliently by damping means to said intermediate member wherein said first wing section and the outer member of said second wing section are aligned generally horizontally and parallel to said main frame when positioned in the non-working position.

4,467,876

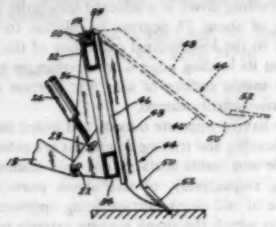
RIPPER TOOTH MEANS

Ronald L. Gaule, P.O. Box 294, North Liberty, Iowa 52317

Filed Oct. 19, 1981, Ser. No. 312,414

Int. Cl.³ A01B *35/14*

U.S. Cl. 172—870 **6 Claims**



1. In combination with a wheeled vehicle having a pair of forwardly extending arms, a frame secured to and extending between said arms, a horizontal shaft removably mounted on said frame, and a ripper tooth means, comprising,

an elongated arm means having upper and lower ends and a longitudinal axis,

a ripper tooth element on the lower end of said arm means,

a sleeve element rigidly fixed to the upper end of said arm means, having a longitudinal axis extending at right angles to the longitudinal axis of said arm means,

said sleeve element being laterally slidably mounted on said horizontal shaft, and said arm means normally resting against said frame and

a stop element on the sleeve element of said arm means adapted to engage said frame after limited rotational movement of said arm means with respect to said frame.

4,467,877

POWER TOOL, IN PARTICULAR A HAND-HELD COMPRESSED AIR SCREWDRIVER

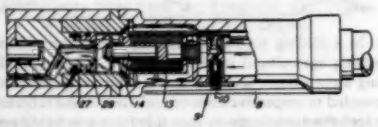
Jürgen K. D. Koltermann, Aalen; Dieter W. Stein, Oberkochen; Eugen Mattheiss, Lauchheim, and Bernhard J. Polzer, Riesburg, all of Fed. Rep. of Germany, assignors to Deutsche Gardner-Denver GmbH, Fed. Rep. of Germany

Division of Ser. No. 31,730, Apr. 20, 1979, Pat. No. 4,320,806. This application Jan. 28, 1982, Ser. No. 343,649

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1978, 2828379

Int. Cl.³ B23Q *5/06*; B25B *23/45*; F16D *43/20*

U.S. Cl. 173—12 **9 Claims**



1. In a power tool for tightening a threaded fastener:

a compressed air motor;

passage means for conducting compressed air to said motor;

a switch for controlling the compressed air supply to said motor;

a shutoff valve disposed in said passage means ahead of a compressed air inlet to said motor, said shutoff valve comprising at least two elements which are arranged coaxially with respect to each other and are movable axially independent of each other; one of said elements comprising a reset element and another of said elements comprising a shutoff element;

biasing means for holding said elements in a starting position while the compressed air supply is shut off by said switch; and,

means for holding said shutoff element in a valve open position associated with the starting position and for releasing said shutoff element at a predetermined torque or angle of rotation applied to said fastener whereby said shutoff element is operable to move in the direction of compressed air flow in said passage means to a valve closed position to shut off compressed air flow to said motor;

said reset element is operable upon introduction of compressed air to said passage means due to actuation of said switch to move away from said shutoff element to a position associated with said closed position of said shutoff element;

said reset element is operable upon cutoff of said compressed air supply to said passage means to reset said shutoff element to said starting position; and,

said shutoff element is elastically biased toward said reset element.

4,467,878

SHAPED CHARGE AND CARRIER ASSEMBLY THEREFOR

Barrie G. Ibsen, P.O. Box 1324, Cut Bank, Mont. 59427

Filed Sep. 4, 1981, Ser. No. 299,479

Int. Cl.³ E21B *43/116*

U.S. Cl. 175—4.6 **13 Claims**

1. A perforating apparatus adapted for use in a cased well bore comprising:

a hollow carrier having an elongated, solid tubular portion provided with an inner wall surface, and opposite end caps disposed in sealed relation to opposite ends of said tubular portion;

a charge-mounting, unitary strap inserted in said carrier, said strap being of elongated, generally rectangular configuration and of a width substantially corresponding to the internal diameter of said tubular portion and provided with spaced openings substantially along its length, each for insertion of a charge therein, said strap dimensioned for snug-fitting insertion into said carrier;

a plurality of explosive charges each having an outer casing of a length substantially corresponding to the internal diameter of said tubular portion, said casing comprising a thin-walled casing portion inserted into one of said openings, said strap and said charges arranged in mutually perpendicular relation to one another and disposed in close-fitting engagement to said inner wall surface of said tubular portion, one end of said casing for each charge provided with an opening for insertion of said blasting chord therethrough; and

a blasting cord extending through said carrier and connected

to said charges for detonation thereof, said carrier being composed of a frangible material capable of being disintegrated upon detonation of said charges.

4,467,879

WELL BORE TOOLS

Edward V. Burge, Houston, Tex., assignor to Richard D. Hawn, Jr., Dallas, Tex.

Filed Mar. 29, 1982, Ser. No. 362,741
Int. Cl.³ E21B 17/10; E21C 9/00
U.S. Cl. 175—325 16 Claims

1. A borehole wall engaging tool having a tubular body adapted to be coupled in a rotary drill string and provided with a cylindrical exterior, comprising

coextensive longitudinal flow passages in the cylindrical exterior of the body for conducting drilling fluid upwardly past said body exterior,

the flow passages being formed by pairs of left and right hand intersecting helical channels extending longitudinally of said body exterior,

each longitudinal helical channel having its upper and lower end portions intersecting the upper and lower end portions of adjacent longitudinal channels of another pair whereby each channel coacts with its adjacent channels to provide longitudinally and transversely spaced polygonal wear surfaces therebetween on said body exterior,

each pair of channels extending at an acute angle relative to each other and being of less transverse width than the spaced polygonal wear surfaces whereby said polygonal surfaces are of greater area than said channels,

said spaced polygonal wear surfaces being disposed in spaced circumferential rows encircling said body exterior,

each spaced circumferential row having its wear surfaces disposed in staggered relation to the wear surfaces of its adjacent rows and thereby permit said longitudinally and transversely spaced relationship of said polygonal wear surfaces;

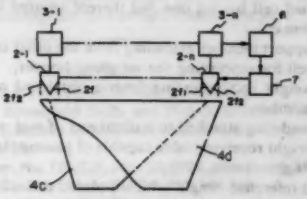
said spaced polygonal wear surfaces of at least one of the spaced circumferential rows are diamond-shaped and have longitudinally and transversely extending corner portions.

4,467,880

COMBINATORIAL WEIGHING APPARATUS

Kazukiyo Minamida, Shiga, and Yugo Fujitani, Ohtsu, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 3, 1982, Ser. No. 414,678
Claims priority, application Japan, Sep. 4, 1981, 56-139980
Int. Cl.³ G01G 19/22, 13/16
U.S. Cl. 177—25 5 Claims



1. A combinatorial weighing apparatus which comprises:

a plurality of weighing hoppers;

a plurality of weighing machines, associated with respective ones of said weighing hoppers, for weighing or counting articles introduced into each of said weighing hoppers;

a combination computing unit adapted to compute combinations based on weight values supplied by each of said weighing machines for selecting predetermined weighing hoppers on the basis of the computed combinations;

a discharge control unit for causing selected weighing hoppers to discharge their articles; and

a chute for collecting the articles discharged from said selected weighing hoppers;

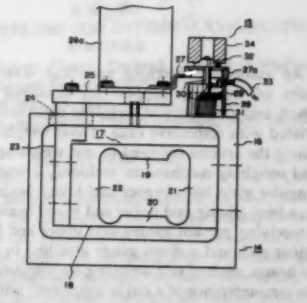
said discharge control unit having means for causing said selected weighing hoppers to discharge their articles into said chute successively in a predetermined order with a predetermined time delay intervening between each discharge operation.

4,467,881

SPAN ADJUSTING DEVICE IN AUTOMATIC WEIGHING MACHINE

Kazumi Kitagawa, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 22, 1982, Ser. No. 421,422
Claims priority, application Japan, Sep. 24, 1981, 56-142241[U]
Int. Cl.³ G01G 19/00, 23/01, 23/14
U.S. Cl. 177—50 2 Claims



1. In conjunction with an automatic weighing apparatus of the type in which the load of a weighing hopper containing articles to be weighed is applied to a corresponding weighing

mechanism through means of a support member adapted for supporting said weighing hopper, and in which the weight is derived as the magnitude of the output signal from a displacement sensor provided on the weighing mechanism, a span adjusting device for performing a span adjustment by loading the weighing mechanism with a reference weight when the span adjustment is carried out, said span adjustment device comprising:

a support frame;

a load cell having one end thereof secured to said support frame;

a support member extending from the other end of said load cell for supporting the weighing hopper;

a weight rest extending from a distal end of said support member;

an end ring attached to a distal end of said weight rest;

a weight receiving table capable of passing through said end ring;

said reference weight which is placed on said weight receiving table at a position remote from said end ring when a weighing operation is performed, and which is placed on said end ring when the span adjustment is performed; and

a single displacement mechanism disposed below said end ring for raising and lowering said weight receiving table.

4,467,882

AUTOMATIC WEIGHING APPARATUS

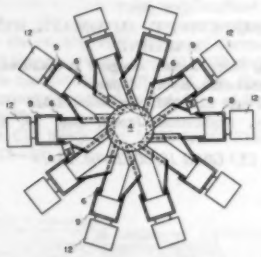
Yoshiharu Mikami, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Sep. 22, 1982, Ser. No. 421,439

Claims priority, application Japan, Sep. 24, 1981, 56-142237

Int. Cl.³ G01G *21/28, 21/23*

U.S. Cl. 177—58 **9 Claims**



1. An automatic weighing apparatus which comprises a plurality of weighing hoppers for receiving articles to be weighed, and a plurality of weighing mechanisms operatively associated with respective ones of said weighing hoppers for weighing the articles received in said weighing hoppers, each of said weighing mechanisms including a load cell having a rectangular main body, upper and lower beams of said main body, a base joining said upper and lower beams at one end, a load receiving portion joining said upper and lower beams at the other end, and a strain gauge attached to said upper and lower beams, each of said weighing mechanisms being arrayed on the circumference of a circle concentric with the weighing apparatus and so arranged that the upper and lower beams of said load cell lie parallel with a tangent line drawn to the circumference of the circle at the location of said weighing mechanism.

4,467,883

WEIGHING APPARATUS INCLUDING PARALLEL GUIDANCE MEMBERS HAVING INTEGRAL GUIDE ARMS

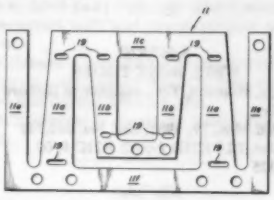
Eugen Meier, Meilen, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Aug. 27, 1982, Ser. No. 411,994

Claims priority, application Switzerland, Dec. 22, 1981, 8198/81

Int. Cl.³ G01G *3/14, 3/00*

U.S. Cl. 177—210 FP **9 Claims**



1. In a weighing apparatus of the short-travel type including a console member (**1**), a load carrier member (**3**), a pair of parallel resilient guide means (**11**, **11'**) connecting said load carrier member for vertical displacement relative to said console member, and load indicating means for indicating the magnitude of a load applied to said load carrier means; the improvement wherein

(a) said load carrier member is arranged immediately adjacent said console member;

(b) and further wherein each of said resilient guide means includes

(1) two pairs of horizontal parallel spaced longitudinally extending arms a first pair of which (**11*a***) is connected at one end with said console, the corresponding ends of the second pair of arms (**11*b***) being connected with said load carrier; and

(2) freely suspended first connecting means (**11*c***) connecting together the other ends of said arms.

4,467,884

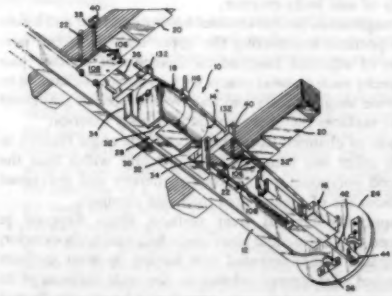
STEERING STABILIZER

Gene V. Robertson, 1906 Esther, Carlisle, Pa. 17013, and Robert G. Robertson, 4522 Sheffield, Corpus Christi, Tex. 78411

Filed Jul. 12, 1982, Ser. No. 397,475

Int. Cl.³ B62D *7/00*

U.S. Cl. 180—90 **14 Claims**



1. A steering stabilizer for a roadway vehicle comprising a stabilizer assembly having a stabilizing bar, a first connection adapted to join one end of the bar to either a vehicle front wheel assembly or a fixed support on the vehicle, a friction unit telescopically engageable with the bar, a second connection adapted to join the friction unit to the other of the front wheel

assembly or vehicle support, the friction unit including a brake shoe on one side of the bar and a clamp unit operable to bias the bar and shoe together to generate a frictional force opposing relative telescopic movement of the stabilizer assembly, said clamp unit including a hydraulic expansion chamber for biasing the brake shoe against the bar, and a system for actuating the clamp unit including a remote control adapted to be located adjacent the vehicle operator, the system including a source of high-pressure hydraulic fluid, a hydraulic line extending from the source to the expansion chamber and the remote control including an actuator moveable from a neutral position to either a first position for actuating the source to increase the pressure of hydraulic fluid in the expansion chamber and thereby increase the frictional engagement between the brake shoe and the bar or to a second position for reducing the pressure of the hydraulic fluid in the expansion chamber and thereby reducing the frictional engagement between the brake shoe and the bar, whereby the operator may increase or decrease frictional engagement between the shoe and bar in accordance with roadway conditions.

4,467,885

VEHICULAR STEERING SYSTEM

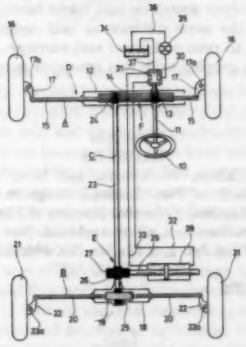
Yoshimi Furukawa, Saitama, and Shoichi Sano, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,802

Claims priority, application Japan, Jul. 28, 1981, 56-118926; Jul. 29, 1981, 56-118698; Jul. 30, 1981, 56-120419; Jul. 30, 1981, 56-120420; Jul. 31, 1981, 56-120243; Jul. 31, 1981, 56-120244; Dec. 26, 1981, 56-211086; Jan. 13, 1982, 57-003726; Jan. 13, 1982, 57-003727; Jun. 9, 1982, 57-098884; Jun. 9, 1982, 57-09885

Int. Cl.³ B62D *5/10*

U.S. Cl. 180—140 **22 Claims**



12. In a vehicular steering system including a steering wheel, right and left front wheels, a front wheel steering mechanism, right and left rear wheels and a rear wheel steering mechanism, with both said front wheels and said rear wheels being steered by said steering mechanisms by operation of said steering wheel, the improvement comprising;

a front wheel stering system which connects said steering wheel with said front wheels through said front wheel steering mechanism;

a connection path which connects said front wheel steering mechanism with said rear wheel steering mechanism;

a rear wheel steering system which connects said steering wheel with said rear wheels through said connection path and said rear wheel steering mechanism;

an auxiliary power means connected to said connection path for assisting said steering wheel in steering operation;

said front wheel steering system and said rear wheel steering system having a common path;

detecting means for detecting a steering torque of said steering wheel being mounted in said common path, said detecting means being connected to said auxiliary power means;

said front wheel steering mechanism comprising a pair of right and left knuckle arms for supporting said right and left front wheels, a pair of right and left tie rods connected to said knuckle arms, and a rack rod connected at both end portions thereof to said right and left tie rods;

said common path including said rack rod; and

said rack rod being in engagement with a pinion adapted to pivot integrally with said steering wheel and also with a pinion which comprises part of said connection path.

4,467,886

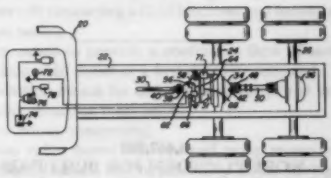
VEHICLE DRIVE CONTROL SYSTEM

Gerald DeClaire, Bloomfield Hills, and Dennis Kramer, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 114,523, Jan. 23, 1980, abandoned. This application Feb. 14, 1983, Ser. No. 466,390

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—197 **22 Claims**



1. Apparatus for use on a vehicle having a main drive shaft and first and second output shafts operable for providing driving torque to wheels of said vehicle and means for coupling said main drive shaft to said first and second output shafts, said apparatus comprising:

(a) means for sensing the relative rotational speed of said first and second output shafts, and

(b) control means responsive to said sensing means detecting a slip condition and including means for eliminating said slip condition (c) means for actuating said means for eliminating said slip condition and providing a control signal,

(d) said actuating means being operable for a predetermined time after actuation thereof and

(e) failsafe timing means operable at a fixed time prior to the end of said predetermined time to deactivate said control means if said control signal is still present at said fixed time.

4,467,887

EXHAUST MUFFLERS FOR INTERNAL COMBUSTION ENGINES

David Vizard, Bishops Cleeve, England, assignor to Shelburne Incorporated, Grand Terrace, Calif.

Filed Nov. 30, 1981, Ser. No. 326,002

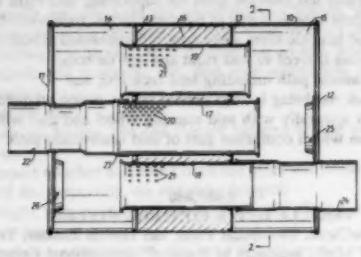
Claims priority, application United Kingdom, Nov. 14, 1981, 8134369

Int. Cl.³ F01H *1/08*

U.S. Cl. 181—265 **7 Claims**

1. An exhaust muffler comprising a closed chamber, an inlet pipe leading into the chamber, an outlet pipe leading from the chamber, at least one pipe length, having an open end, within the chamber, and means for reducing noise in exhaust gases flowing into the chamber through the inlet pipe before the gases pass from the chamber through the outlet pipe, said noise-reducing means including at least one noise reflector located opposite and spaced from the open end of said pipe length within the chamber in such manner as to reflect down

the pipe length a proportion of the noise carried by gases flowing along the pipe length, said noise reflector comprising



two layers of material of different natural frequencies in frictional engagement with one another.

4,467,888

WORK PLATFORM FOR BUILDINGS

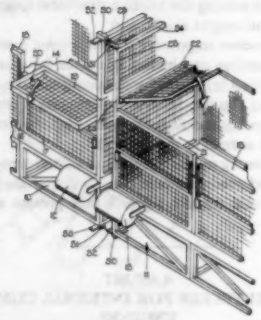
Richard C. Hickling, Stourport-on-Severn, England, assignor to HiRiser Limited, Stourport-on-Severn, England

Filed Mar. 10, 1982, Ser. No. 356,731

Claims priority, application United Kingdom, Mar. 12, 1981, 8107795

Int. Cl.³ E04G *3/10, 3/16*

U.S. Cl. 182—19 **12 Claims**



1. A movable work platform, the platform including:

a guard rail positioned at least at one end of the platform, said guard rail including a movable guard rail part being movable between a working position and a safety position;

switch means for preventing movement of the platform; and

interlock means, operatively connected to said switch means and to said movable guard rail part, for rendering said switch means incapable of being operated by an adjacent platform when said movable guard rail is in said working position and for rendering said switch means capable of being operated by the adjacent platform when said movable guard rail is in said safety position, such that the movement of the adjacent platform is stopped when engaging the platform having said movable guard rail part in said working position.

4,467,889

LADDER-GUIDED SERVICE ELEVATOR

Gerd Maubach, Schwarzdornstr. 10, D-4040 Neuss 21, and Franz-Günter Vogel, Humboldt 41, D-4019 Monheim, both of Fed. Rep. of Germany

Filed Oct. 6, 1982, Ser. No. 433,004

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140236

Int. Cl.³ B66B *9/00*; E06C *7/12*

U.S. Cl. 182—103 **20 Claims**

1. A service elevator for transporting persons up and down a steep surface of a structure, comprising:

a ladder with upright stringers secured to said structure and equispaced horizontal rungs bridging said stringers;

a carriage accommodating a person using the elevator;

a frame on said carriage slidably engaging said stringers;

endless conveyor means on said frame having dogs spaced apart by the same distance as said rungs for coacting therewith to raise and lower said carriage; and

drive means coupled with said conveyor means for operating same.

4,467,890

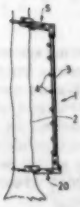
LADDERS

Bruce D. McCallum, Warkworth, and Scott J. McCallum, Matakana, both of New Zealand, assignors to McCallum Enterprises Limited; Federated Farmers of New Zealand and Auckland Province Inc., all of Auckland, New Zealand

Filed Jul. 1, 1982, Ser. No. 394,152

Int. Cl.³ E06C *1/36*

U.S. Cl. 182—206 **9 Claims**



1. A ladder support attachable to a ladder and adapted to grippingly engage an object such as a pole, tree or the like comprising,

an open loop shaped gripping member having two spaced gripping parts adapted to engage substantially opposite portions of the object, an intermediate part spanning between said spaced parts, and an open mouth through which the gripping member is positioned on the object,

a ladder mounting bracket attached at one end to one of said

spaced gripping parts and extending therefrom obliquely upwardly and outwardly with respect to said gripping member when the plane of said gripping member is substantially horizontal in position for use, and

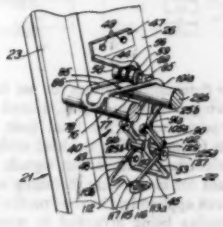
means for pivotally connecting the other end of said bracket to a ladder so that said gripping member can swing substantially vertically towards and away from the ladder to produce self-clamping of said gripping member on said object.

4,467,891

LOCK MECHANISM FOR EXTENSION LADDER

Jonathan L. Shaw, Clinton Township, Hunterdon County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,400
Int. Cl.³ E06C 7/06
U.S. Cl. 182—210 27 Claims



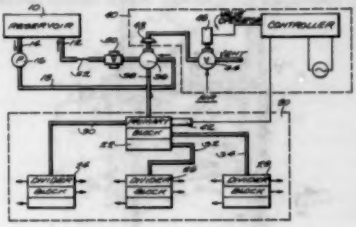
1. A releasable lock mechanism for an extension ladder having slidably coupled base and fly sections located, respectively, relatively forward and rearward of the other, and each comprising side rails and rungs, said mechanism comprising: a rung locking lever having a head at its front and attachable on a fly rail of the ladder through a first pivot to be rotatable thereabout to move said head between positions which are extended and retracted, respectively, relative to such rail and up and down, respectively, relative to the other, and at which such head is adapted to engage the top of and to pass by, respectively, ones of the ladder's base rungs, said head being spaced from said first pivot by a first moment arm, stop means cooperable with said rail and lever to check upward movement of the fully extended head at an uppermost limit position at which such moment arm is primarily normal to said rail, and said head is adapted by engaging the top of a base rung to lock the ladder's fly section against downward sliding, a lock releasing tongue having at one end a tip and attached at its other end to said lever through a second pivot to be rotatable thereabout to move said tip between retracted and extended positions at which, respectively, such tip is adapted to pass by and to be engaged by ones of such base rungs, said second pivot being spaced from said first pivot by a second moment arm, and said tip being adapted during downward sliding of said fly rail to be struck from underneath by successive of said base rungs to be displaced primarily upward thereby relative to said fly rail so as to undergo with each such upward displacement a closing pivoting movement relative to said head, and tongue guide means cooperable with said fly rail and tongue for converting such closing pivoting movements into thrusts exerted by said tongue at said second pivot on said lever to produce pivotings thereof about said first pivot which shift said head from extended to retracted position to enable said lever to pass by such base rungs in the course of such downward sliding.

4,467,892

MICROLUBRICATION CONTROL

David L. Van de Bogert, 226 Thistle Down Lane, Walworth, Wis. 53185

Filed May 8, 1981, Ser. No. 261,847
Int. Cl.³ F16N 29/02; G08B 21/00
U.S. Cl. 184—7.4 5 Claims



1. In a microlubrication system comprising:

A. a reservoir containing a fluid lubricant and having an inlet and an outlet;

B. pump means to provide a continuous flow of said lubricant from said outlet at a first delivery rate; and

C. distribution means for directing said flow to at least one machine requiring lubrication;

the improvements comprising:

D. bypass valve means between said pump means and said distribution means, said bypass valve means having a first state allowing said continuous flow of lubricant to enter said distribution means and a second state diverting said continous flow of lubricant to said reservoir inlet; and

E. control means periodically switching the state of said bypass valve means;

whereby to reduce the average flow of said lubricant to said distribution means to substantially less than said first delivery rate, and further comprising:

F. feedback means to detect and signal the periodic distributions of said lubricant,

G. machine protection means and timer means to actuate said machine protection means whenever the time interval between successive periodic distributions of said lubricant exceeds a predetermined time interval, and wherein said machine protection means comprises means to maintain said bypass valve means in said first state.

4,467,893

FOLDING FORK LIFT WITH A MULTIPLE TELESCOPING TOP LIFT ATTACHMENT

Lloyd L. Hobson, 312 North East St., Elnora, Ind. 47529

Filed Jul. 19, 1982, Ser. No. 399,335
Int. Cl.³ B66B 9/20
U.S. Cl. 187—9 R 13 Claims

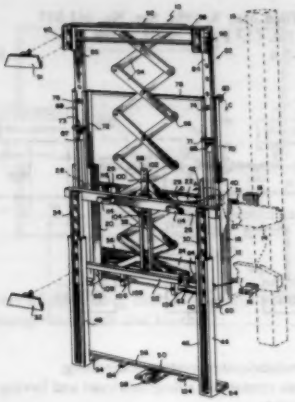
1. An attachment for a lift truck comprising:

a base unit attachable to a vertically movable carriage of the lift truck,

a lower stage slidably engaged on the base unit,

at least one upper stage slidably engaged to the base unit, and

telescoping means for upwardly telescoping the at least one upper stage relative to the base unit simultaneously with a



downward motion of the base unit with respect to the lower stage.

4,467,894

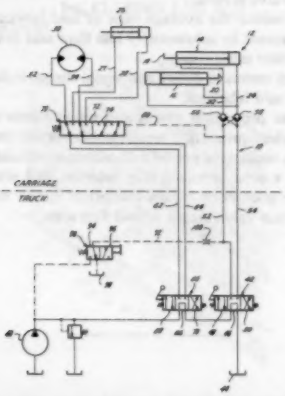
FLUID POWER SYSTEM

Stuart W. Sinclair, Lake Jackson, Tex., assignor to Anderson, Clayton & Co., Houston, Tex.

Filed Jan. 15, 1982, Ser. No. 339,550

Int. Cl.³ B66B *11/04*

U.S. Cl. 187—17 **8 Claims**



1. A fluid power system having a fluid power source for actuating three separately controllable reversible fluid motors each for selectively providing a separate function and each having a pair of fluid lines comprising,

a first function valve connected between the power source and the pair of lines connected to the first motor,

a second function valve connected between the fluid source and a pair of power lines,

a selector valve connected to at least one of the power lines for receiving fluid therefrom and connected to at least one of the lines connected to each of the second and third motors for selectively connecting one of the second and third motors to the power lines,

a pilot control line connected between one of the pair of lines to the first motor and to said selector valve for actuating the selector valve, and

a control valve connected between a fluid source and said one of the pair of lines to the first motor for supplying fluid to and actuating the selector valve.

4,467,895

SLACK ROPE DETECTING APPARATUS

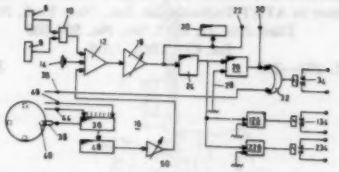
Ernest B. Smith; Phillipus D. Slabbert; Bernardus J. Bout, and Peter C. Vickers, all of Transvaal, South Africa, assignors to Crucible Society Anonyme, Luxembourg, Luxembourg

Filed Jun. 11, 1982, Ser. No. 387,480

Claims priority, application South Africa, Jun. 15, 1981, 81/4014

Int. Cl.³ B66B *5/12*

U.S. Cl. 187—29 R **8 Claims**



1. A slack rope detecting apparatus for use in mine winding arrangements having a winding engine, a head gear including a sheave wheel supported in the head gear, the apparatus comprising means for monitoring the load in the rope and for producing first electrical load output signals corresponding thereto, said means for monitoring including means arranged to monitor the force applied by the rope on the head gear, said means for monitoring being arranged to monitor the force applied between the sheave wheel and at least one of its supports, and an electrical circuit means including comparator means arranged to receive the load output signals and compare the output signals with a predetermined value and to produce a winding engine trip signal whenever the load output signals fall below a predetermined value.

4,467,896

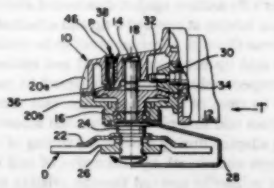
LOCKING MECHANISM FOR A ROTARY POWER MACHINE

William D. Sauerwein, Westminster; Steve A. Weber, Glyndon, and John E. Dibbern, Jr., Street, all of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 17, 1983, Ser. No. 505,319

Int. Cl.³ B62C *7/02*

U.S. Cl. 188—69 **11 Claims**



1. A rotary power tool having a locking mechanism for selectively locking rotatable power transmitting components of the tool, said tool including a source of rotary power and an output spindle contained within a housing, said rotary power tool comprising:

at least one 1-piece rotatable power transmitting component connected between the source of rotary power and the

output spindle, said power transmitted component having at least one lock pin-receiving bore therein;

a locking pin means mounted on the tool housing for movement between a retracted, non-locking position and an extended, locking position in which said locking pin is receivable within said lock pin-receiving bore to thereby lock the power transmitting components from motion; and

ramp means formed as part of said power transmitting component and positioned adjacent to said lock pin-receiving bore for engagement with an extended lock pin during rotation of said power transmitting component in a first direction and for moving said lock pin toward its non-locking position.

4,467,897

DISC BRAKE WITH FIRST AND SECOND SPRINGS FOR PREVENTING THE VIBRATION OF FRICTION PAD

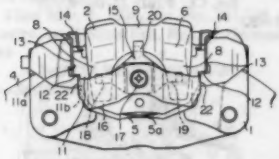
Takaaki Kubo, and Kinzo Kobayashi, both of Kanagawa, Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Dec. 16, 1982, Ser. No. 450,549

Claims priority, application Japan, Dec. 18, 1981, 56-189249[U]

Int. Cl.³ F16D 65/00

U.S. Cl. 188—73.38 **4 Claims**



1. A disc brake including a carrier adapted to be mounted on a non-rotatable part of a vehicle, a caliper straddling a part of the outer circumference of a rotatable disc and having inner and outer leg portions, said caliper being supported on the carrier to slide in the direction of the axis of the disc, and inner and outer friction pads slidably mounted on the carrier respectively, wherein first and second springs are mounted on the outer friction pad with the central portions thereof being secured to the outer friction pad, arm portions of the first spring engaging with the outer leg portion of the caliper, and the end portions of the second spring being inserted between the circumferentially opposite ends of the outer friction pad and the carrier respectively and being slidable relative to the carrier.

4,467,898

DISC BRAKE

Pierre Courbot, Villiers le Bel, and Jean-Jacques Carré, Montreuil, both of France, assignors to Societe Anonyme DBA, Paris, France

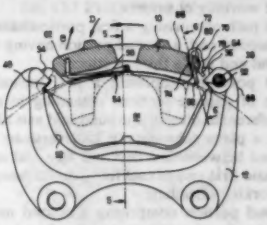
Filed Apr. 9, 1981, Ser. No. 252,565

Claims priority, application France, Dec. 5, 1979, 79 29852

Int. Cl.³ F16D 65/09

U.S. Cl. 188—73.44 **8 Claims**

1. Disc Brake whose caliper (10) is mounted to slide on a fixed support (12) in an aperture (32) in which two friction members (18, 26) are received for anchoring and for axial sliding, which are able to come into frictional engagement with the opposite faces (22, 30) of a turning disc (24) upon actuation of a brake actuator (16) acting directly on one of the friction members (18) and, by reaction through the sliding caliper (10), on the other friction member (26), said caliper (10) being mounted to slide by means of an axial column (38) fixed to the fixed support (12) and which cooperates with a bore (40, 42) formed opposite to it in the caliper (10) and by means of two complementary, axially sliding surfaces (46, 48), formed on the caliper and on the fixed support, so as to allow relative axial movements of the caliper (10) with respect to the fixed support (12) while opposing swinging of the caliper about said column (38) when the caliper is in its normal working position and so as to allow swinging of the latter when extraction of the said friction members (18, 26) is required, resilient means (54) being provided to normally keep said complementary surfaces (46, 48) in mutual contact in said normal working position of said



caliper, characterized in that one of said axially sliding surfaces (46) presents a limited axial length (l) such that a manually controlled axial displacement of the caliper (10) with respect to the fixed support (12) over a distance greater than said limited length (l) towards a disengaged position away of said normal working position allows swinging of the caliper (10) about said column (38) to permit servicing of the friction members (18, 26) without removing said column, said resilient means (54) being constituted by a spring disposed between said caliper (10) and said friction members (18, 26).

4,467,899

CYLINDER-PISTON DEVICE

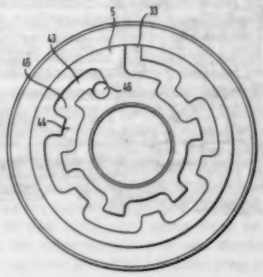
Werner Mölders, Plaidt; Herbert Freitag, Koblenz-Metternich, both of Fed. Rep. of Germany, and Lawther O. Smith, Doylestown, Pa., assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Continuation of Ser. No. 214,654, Dec. 9, 1980, abandoned. This application Jul. 22, 1983, Ser. No. 516,662

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1979, 2950888

Int. Cl.³ F16F 9/19

U.S. Cl. 188—320 **13 Claims**



1. In a cylinder-piston device, comprising:

a cylinder having an axis and two end walls;

a cavity defined within said cylinder;

an axially movable piston rod extending toward and outward of said cavity through an aperture in at least one of said end walls;

a piston unit within said cavity and operatively connected to said piston rod, said piston unit defining first and second

working chambers within said cavity and including a piston member, said piston member having two axially directed end faces, namely a first end face adjacent said first working chamber and a second end face adjacent said second working chamber, each of said end faces lying in a plane substantially perpendicular to the axis of said cylinder and being substantially covered by a first and a second cover plate, respectively;

a fluid within said cavity;

at least one fluid path interconnecting said first and said second working chambers;

said fluid path comprising a first portion having a first end and a second end, a second portion having a first end and a second end and a third portion;

said first portion comprising a first meander-shaped sequence of passage sections extending in a substantially circumferential direction around said axis of said cylinder, and in a plane substantially transverse to said axis, and provided between said first end face and said first cover plate, said first end of said first portion being open to said first working chamber;

said second portion comprising a second meander-shaped sequence of passage sections extending in a substantially circumferential direction around said axis of said cylinder, and in a plane substantially transverse to said axis, and provided between said second end face and said second cover plate, said first end of said second portion being open to said second working chamber;

said third portion comprising a substantially axially directed bore through said piston member and interconnecting said second end of said first portion and said second end of said second portion.

4,467,900

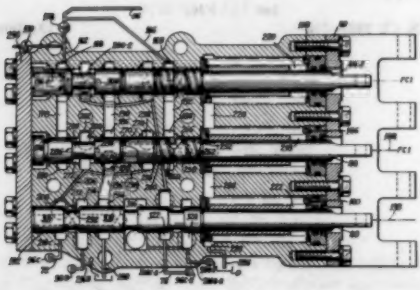
CLUTCH-BRAKE STEERING MECHANISM FOR TRACTORS

Daniel B. Shore, Niles, and Probir K. Chatterjea, Mount Prospect, both of Ill., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 252,533, Apr. 9, 1981, Pat. No. 4,407,328. This application May 23, 1983, Ser. No. 488,221

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—13 R **6 Claims**



1. Clutch-brake system with a frame including:

generally annular, generally confronting clutch and brake cylinders having an output member common thereto;

clutch-brake friction engageable surfaces operatively disposed between the common output member and each of the clutch and brake cylinders and engageably and disengageably controlled by the latter primarily in alternation to one another;

first means biasing the brake friction engageable surfaces toward engaged position, in opposition to the brake cylinder;

second means biasing the clutch friction engageable surfaces toward disengaged position, in opposition to the clutch cylinder; and

means for connecting the cylinders to a common, restricted, inlet-outlet port means for fluid pressure applied and released in the system whereby, when fluid cylinder pressure is being applied the brake cylinder has a pressure-forced, brake-disengaged condition when the clutch cylinder is pressure-moved for partial or full clutch engagement and whereby, when fluid cylinder pressure is being released, the second biasing means affords an expandibly-forced clutch-disengaged condition when the first biasing means expandibly-moves for partial or full brake engagement.

4,467,901

TEMPERATURE RESPONSIVE, PNEUMATICALLY ACTUATED, FLUID SHEAR, COOLING FAN CLUTCH AND A CONTROL PROVIDING THREE STEP VARIATION THEREOF

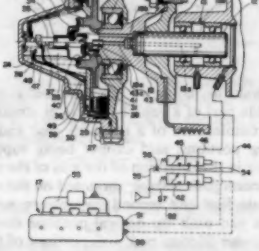
Kenji Hattori; Kongou Aoki, both of Kariya, and Masaharu Hayashi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 5, 1982, Ser. No. 346,250

Claims priority, application Japan, Feb. 13, 1981, 56-19860[U]

Int. Cl.³ F16D *35/00, 43/25*

U.S. Cl. 192—52 **1 Claim**



1. A cooling fan device for use with an internal combustion engine, comprising

a viscous fluid coupling means which includes an input means drivingly connected to the engine, an output means provided with a fan for cooling a radiator of the engine and rotatable relative to said input means, a fluid-tight chamber, a partition plate for dividing said chamber into a viscous fluid working chamber and a viscous fluid reservoir chamber, said input means being on the working chamber side of said partition plate, said partition plate having a first and a second hole for permitting viscous fluid communication between said reservoir chamber and said working chamber to hydrodynamically transmit rotational power from said input means to said output means, and stepwise control means for controlling the amount of viscous fluid in said working chamber, said stepwise control means including

means for sensing the temperature of cooling water in the engine, a slidable plug on the reservoir chamber side of said partition plate, an inner cover secured to said input means to form an air chamber therein, said inner cover having a center opening through which said slidable plug extends in sealing relationship therewith, a diaphragm dividing said air chamber into two opposed chambers, the

outer periphery of said diaphragm being fixed to said input means and the inner periphery of said diaphragm being attached to an inner end of said slidable plug, a first valve plate secured to an outer end of said plug to open or close said first hole of said partition plate, a second valve plate positioned to be engaged by said outer end of said plug to open or close said second hole of said partition plate, first and second changeover valve means connected to a source of suction air pressure and a source of atmospheric air pressure, first passage means connecting said first changeover valve means and a first one of said opposed chambers, second passage means connecting said second changeover valve means and said first opposed chamber, each said change-over valve means being for regulating in accordance with the temperature of the engine cooling water the supply of suction pressure and atmospheric pressure through each respective passage means into said first opposed chamber defined by said diaphragm for moving said plug and each said valve plate secured thereto to effect a three stepwise control of viscous fluid flowing to said working chamber and provide a three stepwise variation in the speed of rotation of said fan.

4,467,902
OVERLOAD CLUTCH

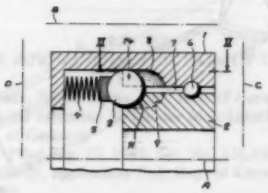
Sobhy L. Girguis, Magdalenenstr. 19, 5210 Troisdorf-Oberlahr, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 241,736

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009244

Int. Cl.³ F16D 7/06, 43/20

U.S. Cl. 192—56 R **17 Claims**



1. An overload clutch comprising:

a driving clutch member and a driven clutch member rotatable about a common axis and separated from each other by an annular gap of invariable radial width centered on said axis, said clutch members being provided with respective sets of peripherally spaced recesses which are mutually aligned across said gap in a normal relative position thereof;

a plurality of coupling elements arrayed about said axis, said coupling elements being partly receivable in pairs of aligned recesses of the two sets;

biasing means effective in the direction of said axis for resiliently urging said coupling elements into positive engagement with respective pairs of aligned recesses during joint rotation of said clutch members, the recesses of at least one of said clutch members having camming edges for axially dislodging said coupling elements therefrom against the force of said biasing means upon the occurrence of an overload whereby said driven clutch member is decoupled from said driving clutch member; and

guide means operatively connected with the other of said clutch members, said guide means forming peripherally spaced-apart lodgments which communicate with said pairs of recesses in said normal relative position for intercepting the dislodged coupling elements and confining same in predetermined relative positions upon decoupling of said members from each other.

4,467,903
TEMPERATURE RESPONSIVE, PNEUMATICALLY ACTUATED, FLUID SHEAR, COOLING FAN CLUTCH AND CONTROL THEREFOR

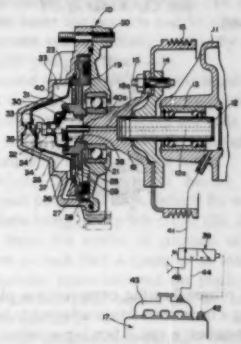
Masaharu Hayashi, Toyota; Makoto Nakagawa, and Kenji Hattori, both of Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 8, 1982, Ser. No. 346,991

Claims priority, application Japan, Feb. 10, 1981, 56/17928[U]

Int. Cl.³ F16D 35/00, 43/25

U.S. Cl. 192—58 B **1 Claim**



1. A cooling fan device for use with an internal combustion engine, comprising:

a viscous fluid coupling means which includes an input means drivingly connected to the engine, an output means provided with a fan for cooling a radiator of the engine and rotatable relative to said input means, said input and output means defining therebetween a fluid-tight working chamber into which an amount of viscous fluid can be admitted to hydrodynamically transmit rotational power from said input means to said output means, said output means having a partition means for separating from said working chamber a reservoir chamber provided in said output means for storing an additional amount of the viscous fluid, said partition means having formed therein a hole for permitting the flow of the viscous fluid from said working chamber to said reservoir chamber, and a viscous fluid valve means operable to close said hole thereby causing a decrease in the amount of the viscous fluid within said working chamber to reduce the power transmitted from said input means to said output means, and means for controlling the operation of said viscous fluid valve means, said control means including

means for sensing the temperature of engine cooling water, a slidable plug on the reservoir chamber side of said partition means, an inner cover secured to said input means to form an air chamber therein, said inner cover having a center opening through which said slidable plug extends in sealing relationship therewith, a diaphragm dividing said air chamber into two opposed chambers, the outer periphery of said diaphragm being fixed to said input means and the inner periphery of said diaphragm being attached to an inner end of said slidable plug, said viscous fluid valve means being secured to an outer end of said plug to open or close said hole of said partition means, changeover valve means connected to a source of suction air pressure and a source of atmospheric air pressure, passage means connecting said changeover valve means and a first one of said opposed chambers,

said changeover valve means being for regulating in accordance with the temperature of the engine cooling water the supply of suction pressure and atmospheric pressure through said passage means into said first opposed cham-

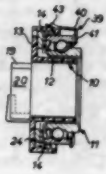
ber defined by said diaphragm for moving said plug and said fluid valve means secured thereto to effect control of viscous fluid flowing to said working chamber and provide variation in the speed of rotation of said fan.

4,467,904

CLUTCH RELEASE BEARINGS

Pierre Renaud, Le Plessis-Trevise, France, assignor to Valeo, Paris, France

Filed Apr. 7, 1981, Ser. No. 251,927
Claims priority, application France, Dec. 18, 1980, 80 26885
Int. Cl.³ F16D *23/14*
U.S. Cl. 192—98 **23 Claims**



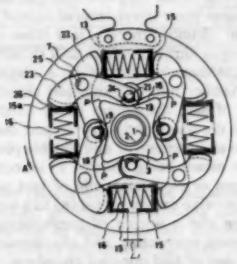
1. A clutch release bearing comprising a plastic operating member having a transverse flange adapted to be controlled by an actuating member, a metal bearing member against which the actuating member is adapted to bear, a drive or thrust member adapted to coact with a release mechanism of an associated clutch in response to the action of said operating member, coupling means for axially coupling said drive or thrust member to the operating member, said bearing member bearing axially against one side of said flange of said operating member turned toward said drive or thrust member, said flange having passageways providing access to said bearing member for the actuating member, and means for axially holding said bearing member on said one side of said flange including an annular holding member bearing axially in one direction against said operating member and bearing axially in the other direction against said bearing member to hold said bearing member in contact with said flange.

4,467,905

CLUTCH DISC

Hiroshi Takeuchi, Higashi-Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Apr. 13, 1982, Ser. No. 367,984
Claims priority, application Japan, Apr. 20, 1981, 56-59956
Int. Cl.³ F16D *3/64*
U.S. Cl. 192—106.2 **6 Claims**



1. A clutch disk comprising:

a spline hub having a cam flange of polygonal shape having concave cam faces at its outer periphery;

a clutch plate and a retaining plate arranged at the sides of said cam flange;

a plurality of lever pins fixing said clutch plate and said retaining plate together with a spece therebetween, said pins each being positioned radially outward from a corner of said polygonal cam flange and on a common circumference;

a plurality of rollers, one of said rollers pressing against each face of said cam flange;

a plurality of torsion springs arranged axially circumferentially between said clutch plate and said retaining plate, each of said springs being positioned radially outward from a face of said polygonal cam; and

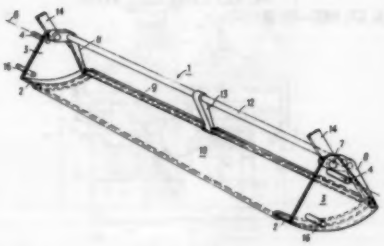
a plurality of substantially L-shaped levers supported at an intermediate position by said lever pins, each of said levers having an outer end pressed against an end of one of said springs and an inner end engaged with one of said rollers, and being so arranged that their inner ends are urged radially outwardly by rotation of said cam face with respect to said rollers whereby their outer ends apply circumferential torsion pressure against said springs.

4,467,906

TRANSPORT HANGER FOR TRANSPORTING DOUGH PORTIONS

Helmut König, Ursprungweg 70-72, Graz, Austria A-8045

Filed Feb. 11, 1982, Ser. No. 348,120
Claims priority, application Austria, Feb. 20, 1981, 795/81
Int. Cl.³ B65G *17/16*
U.S. Cl. 198—705 **8 Claims**



1. A suspended hanger pivotally mounted for rotation about a horizontal axis comprising a frame having a substantially horizontally extending means for supporting dough portions, said support means having an edge, a band means of flexible material surrounding said support means and covering same in form of a closed loop and being in contact with said support means, a rod extending substantially parallel to said support means and being connected to said band means, and a drive means acting on said rod for moving the rod along the surface of said support means for moving the dough portions resting on said band means towards said edge.

4,467,907

FAST-DUMP FEEDING APPARATUS FOR INDIVIDUALLY FEEDING FASTENER PARTS

George R. Snyder, Woodbridge, and Walter H. Dziura, Naugatuck, both of Conn., assignors to Scovill Inc., Waterbury, Conn.

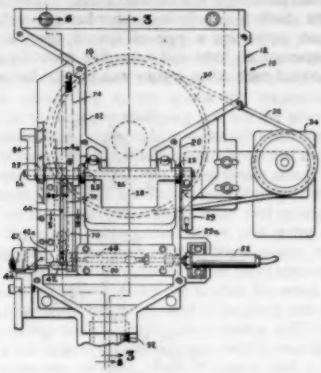
Filed Aug. 17, 1982, Ser. No. 408,753
Int. Cl.³ B65G *47/24, 47/19*
U.S. Cl. 198—368 **4 Claims**

1. A fast-dump feeding apparatus for individually feeding fastener parts comprising:

(a) a hopper having an openable door at the lower end thereof;

(b) a vertical chute integral with the side of the hopper and accessible to the inside of the hopper;

(c) drive means for moving parts from the bottom of the hopper to the vertical chute;
(d) a movable horizontal shutter at the lower end of the vertical chute;
(e) a pusher having a path across the top of the movable shutter and adapted to push individual fastener parts



through a side opening in the chute immediately above the shutter; and
(f) operating means associated with the shutter and the door to open them; whereby upon operation of the operable means the door and the shutter will open to permit rapid downward evacuation of the individual parts in the hopper and chute.

4,467,908

DEVICE FOR THE DISTRIBUTION OF UPRIGHT VESSELS

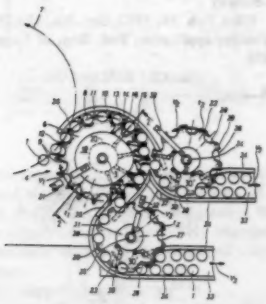
Egon Schneider, Neutraubling, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Worth, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 423,918

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141364

Int. Cl.³ B65G *47/84*

U.S. Cl. 198—441 **15 Claims**



1. Apparatus for converting a series of moving vessels such as bottles into a plurality of rows of vessels comprising:
a rotationally driven generally circular rotor (4) having circumferentially spaced apart prongs (10, 11) extending radially outward from the periphery of the rotor, said prongs defining pockets between them for receiving said vessels in series, alternate prongs (10) being curved in the direction of rotor rotation and extending radially beyond a pitch circle (8) whose radial distance from the center of rotor rotation coincides with the center of the vessels and permits said alternate prongs to remove vessels from said single row at an in-feed station and move them in sequence orbitally on said rotor,
releasable gripper means provided on said rotor for gripping the vessels when they enter the pockets at the in-feed station and while they are in orbit on the rotor, said releasable gripper means comprising first and second sets of gripper means respectively associated with alternate pockets of said rotor,
means for acutating said gripper means (13, 16) to grip when the bottles enter the pockets and to release the grip and urge alternate vessels radially outwardly at first and second transfer points, respectively,
first and second star-wheel conveyors located adjacent said first and second transfer points, respectively, said star-wheel conveyors (22, 23) being drivable in synchronism with the rotor, in the opposite direction of rotation and at lower peripheral speed than the rotor,
said star-wheel conveyors each having circumferential spaced apart pockets at its periphery for receiving vessels, said pockets being on a pitch circle (26, 27) whose radial distance from the center of rotation of the star-wheel conveyors is such that a space of at least one-half of a vessel diameter exists between the pitch circle (8) of the rotor (4) and the pitch circles (26, 27) of the star-wheel conveyors (22, 23),
a guide member (36) disposed partially around said rotor (4) and diverging away from said rotor while extending across the rotational path of said pockets (28) in said first star-wheel conveyor (22) so that when one of said alternate gripper means releases a vessel in the series from the rotor in the vicinity of said first transfer point said vessel will be moved under the influence of said rotor and guided by said guide member (36) into a pocket on said more slowly rotating first star-wheel conveyor,
another guide member (37) disposed outside of the periphery of said rotor and extending from beyond where said one of the vessels has entered a pocket in the first star-wheel conveyor to across the path of the pockets (28) in said second star-wheel conveyor (23) and still another guide member (35) having an end disposed across the path of the pockets in said rotor (4) and extending partially around said second star-wheel conveyor so that when another of said alternate gripper means releases in the vicinity of said second transfer point another vessel from the rotor (4) that was formerly next to said one vessel in the series said other vessel will be moved under the influence of said rotor and guided by said guide-members (37, 35) into a pocket of the more slowly rotating second star-wheel conveyor (23).

4,467,909

INFEED AND DISCHARGE STAR

Norbert Jörss, Neutraubling, Fed. Rep. of Germany, assignor to Pirzer Co., Neutraubling, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,984

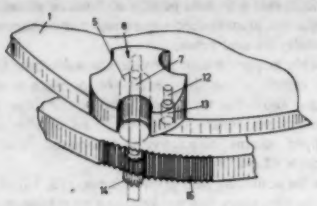
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143511

Int. Cl.³ B65G *29/00, 37/00, 35/00*; B65C *9/00*

U.S. Cl. 198—481 **10 Claims**

1. An infeed or discharge start for engaging containers and for transporting the same to or from a labeling or filling station, said star including a carrousel rotatably mounted about a first axis and having an outer periphery, a plurality of setting devices mounted in spaced apart relation adjacent the periphery

of the carrousel, the improvement wherein each setting device is rotatably mounted on the carrousel and includes a plurality



of arcuate surfaces each having a different radius of curvature for engaging containers of different sizes.

4,467,910

VERTICAL CONVEYOR FOR BULK GOODS

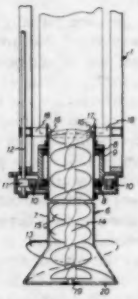
Olle L. Siwersson, Helsingborg, and Arne E. Wall, Landskrona, both of Sweden, assignors to AB Scanlainventor, Helsingborg, Sweden

Filed Nov. 23, 1981, Ser. No. 323,796

Claims priority, application Sweden, Nov. 28, 1980, 8008347

Int. Cl.³ B65G *65/16*

U.S. Cl. 198—518 **7 Claims**



1. A bulk material conveyor comprising a belt conveyor having two belts which are in face-to-face relationship and between which the bulk material is conveyed in an upward direction from an entrance end at a lower portion of said belt conveyor, a downwardly directed screw conveyor fixedly mounted on the lower portion of said belt conveyor, said screw conveyor having its delivery opening directly connected onto the entrance end between said belts, a material supplying device at the entrance opening of said screw conveyor, a screw of said screw conveyor is rigidly connected to a frame of said belt conveyor and stationary, and wherein a housing of said screw conveyor is rotatably mounted for rotation about said screw, said housing of said screw conveyor connected to an annular gear rim with which a pinion meshes, said pinion being driven by a motor spaced from the entrance end.

4,467,911

PLASTIC CLEVIS FOR CONVEYOR TROLLEY AND HANGER

David J. Forshee, Hilton Head, S.C., assignor to Formall SynTrac Systems, Inc., Madison Heights, Mich.

Filed Jul. 14, 1982, Ser. No. 398,402

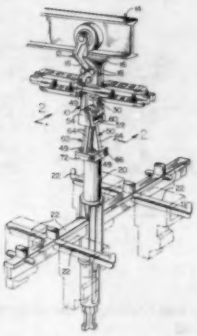
Int. Cl.³ B65G *17/32*

U.S. Cl. 198—648 **12 Claims**

1. A plastic two-piece clevis device for manually detachably mounting a parts carrying hanger from a monorail conveyor trolley comprising:

a plastic upper clevis member having a medial plate the upper end of which is detachably connected to said trolley, and a flange member having a base and a lateral rib spaced outwardly from and on each side of said medial plate defining a slot therebetween,

and a plastic lower clevis member having a yoke at its upper end supporting a pair of spaced apart arcuate bodies mounted on hubs and extending inwardly of said yoke toward each other, a yoke web portion having an arcuate



upper surface spaced from the adjacent surfaces of said arcuate bodies a distance slightly or somewhat greater than the thickness of said base but not greater than the combined thickness of said base and the height of said lateral rib, a column supporting said yoke, and a base plate adapted to be detachably connected to a parts carrying hanger suspended therefrom, said arcuate bodies adapted to rotate in said slots on each side of said medial plate,

said lower clevis member being manually detachably suspended from said upper clevis member by said arcuate bodies and said lateral ribs.

4,467,912

BOOK BLOCK GRIPPER FOR A TRANSPORT SYSTEM

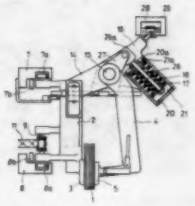
Horst Rathert, Minden, Fed. Rep. of Germany, assignor to Rahdener Maschinenfabrik August Kolbus, Rahden, Fed. Rep. of Germany

Filed Feb. 19, 1982, Ser. No. 350,252

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107458

Int. Cl.³ B65G *47/86*

U.S. Cl. 198—650 **2 Claims**



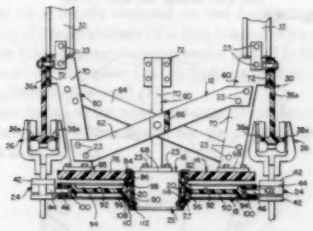
1. In a gripper mechanism for a book block transport system, the gripper mechanism being continuously moved along a closed path and possessing a movable frame to which a stationary inner clamping jaw is affixed, the inner clamping jaw having a work contacting surface which defines a plane, the gripper mechanism further including a pivot arm which sup-

ports an outer clamping jaw, the outer clamping jaw also having a work contacting surface which defines a plane, the pivot arm being mounted on a shaft of the movable frame, the shaft having an axis and being oriented parallel to the plane defined by the work contacting surface of the inner clamping jaw, the work contacting surface of the outer jaw assuming a position substantially parallel to the work contacting surface of the inner clamping jaw when gripping a book block, the pivotal movement of the outer clamping jaw supporting pivot arm and the resultant application of the clamping force to this jaw being effected by cam means via a force transmission lever, the improvement comprising spring means for transmitting a clamping force to the outer clamping jaw via the pivot arm, said spring means being connected in series with and functionally located between the force transmission lever and the pivot arm of the outer clamping jaw, said spring means comprising a pre-loaded stack of cup springs and means for supporting said spring stack on the force transmission lever, said spring stack possessing a degressive characteristic curve, said spring means further comprising means for coupling the opposite ends of said stack of cup springs respectively to the force transmission lever and the pivot arm whereby the motion imparted to the lever by the cam means will be coupled to the pivot arm via the stack of cup springs and said stack of cup springs will function to generate a pre-selected clamping force which remains constant with variations in book block thickness and to damp acceleration shocks, said coupling means including a tension rod and means pivotally coupling a first end of said tension rod to the outer jaw supporting pivot arm, the second end of said tension rod being connected to a first end of the stack of cup springs.

4,467,913
PLASTIC MONORAIL CONVEYOR DRIVE CHAIN WHEEL

James S. Salloum, Oxford, Mich., assignor to Formall Syn-Trac Systems, Inc., Madison Heights, Mich.

Filed Dec. 13, 1982, Ser. No. 448,926
Int. Cl.³ B65G *17/32*
U.S. Cl. 198—687 **24 Claims**



1. In a plastic monorail conveyor structure including contiguous connected straight and arcuate sections of an inverted T-bar track in end-to-end abutting relationship, the improved idler or drive wheel structure operatively engaged by a chain drive for an arcuate section of said monorail conveyor structure comprising:

a plastic disc support plate,

structural means affixed to and supporting said disc support plate in a relatively elevated attitude adjacent and below the plane and axially of said arcuate T-bar track section,

a plastic hub secured to said disc support plate and having a cylindrical bearing portion extending axially therefrom and therebelow,

a chain drive engaged plastic wheel freely rotatable about said hub bearing portion,

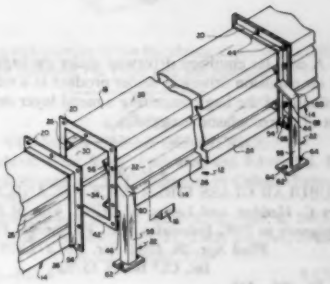
and a plastic collar secured to said hub bearing portion at the distal end thereof,

said wheel being rotatable and bearing upon a thrust surface of said collar.

4,467,914
MEANS FOR ALIGNING AND SECURING ADJACENT CONVEYOR TROUGH STRUCTURES

Edward L. Trammel, 400 W. Central, Wichita, Kans. 67203, and Hugh D. Kelley, 1451 Morgantown, Wichita, Kans. 67212

Filed Sep. 18, 1978, Ser. No. 942,924
Int. Cl.³ B65G *21/10*
U.S. Cl. 198—861 **5 Claims**



1. Means for aligning and securing adjacent conveyor trough structures, comprising:

(a) a plurality of conveyor trough means connected at adjacent ends thereof;

(b) each conveyor trough means having a housing with a top wall, a bottom wall, and parallel upright sidewalls;

(c) each of said sidewalls having a wedge receiving area at said adjacent ends of said conveyor trough means;

(d) said adjacent ends having a connector flange assembly having an inner leg mounted against a respective one of said sidewalls to form an outer wall of said wedge receiving area;

(e) said wedge receiving areas of said sidewalls having a conveyor chain support member therein being an indentation having a first upper wall section which is adapted to support a first portion of a conveyor chain structure thereon;

(f) an alignment and anchor wedge member mounted in each of said wedge receiving areas and against a respective one of said inner legs under force to place adjacent ones of said first upper wall sections in alignment to place an upper surface of said first upper wall sections in a common plane;

(g) said sidewalls having formed said conveyor chain support member therein being a triangular shaped indentation;

(h) said adjacent ends of said conveyor trough means having said connector flange assembly mounted about its periphery;

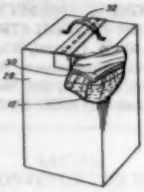
(i) said connector flange assembly having an outer leg in a vertical plane to be connected to adjacent ones of said outer legs; and

(j) said outer legs of abutting ones of said conveyor trough means interconnected by connector members but not requiring precision alignment thereof as said first upper wall sections are aligned by said alignment and anchor wedge members.

4,467,915
EMULSION PACKAGE AND METHOD OF MIXING THE EMULSION

Robert G. Seyder, Norway, Me.; John J. Clancy, Westwood, and Richard S. Brenneman, Natick, both of Mass.

Continuation-in-part of Ser. No. 179,730, Aug. 20, 1980, Pat. No. 4,343,398. This application Aug. 6, 1982, Ser. No. 405,712
Int. Cl.³ B65D *81/30, 35/28, 33/36, 85/00*
U.S. Cl. 206—219 12 Claims

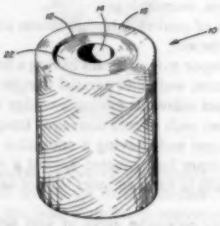


1. A coal tar emulsion driveway sealer package comprising coal tar emulsion driveway sealer product in a sealed bag, the membrane of the bag comprising a metal layer deposited on a sheet of thermoplastic material.

4,467,916
TUBULAR GLASS FIBER PACKAGE AND METHOD

Jerry C. Hedden, and Lesley M. Allen, both of Shelby, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1982, Ser. No. 371,899
Int. Cl.³ B65H *55/02*
U.S. Cl. 206—410 20 Claims



1. A tubular package of continuous sized glass fiber strand or strands, comprising:

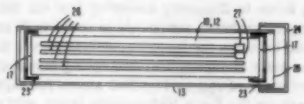
a. continuous glass fiber strand or strands wound in superimposed annular layers to have a longitudinal, cylindrical cavity in the center of the package and an outer cylindrical shape and a substantially flat top and bottom section, where one or more free ends of glass fiber strands extend into the cavity for removal from the center of the package,

b. polymeric film stretched around the outer peripheral surface of the package and extending at least about 0.5 inches (1.27 cm.) onto the flat top and bottom sections of the package, where the polymeric film as an unstretched film has a stress modulus of around at least 1200 pound/-square inch at 100 percent elongation and a percent elongation of at least about 5 and a thickness of about 0.75 to about 10 mils that has been stretched around the package with a pulling force of greater than 4 pounds (18 Newtons) but not great enough to cause the stretched film to collapse when all of the strand or strands have been removed through the center of the package to produce conformational film about the outer peripheral surface and portions of the top and bottom sections of the package that is free-standing upon removal of the strand or strands from the center of the package.

4,467,917
CARRIER TUBE FOR PRINTS, SHEETS OR ARTISTIC CANVASES

Kelichiro Hayashi, 31 Carol Rd., Westfield, N.J. 07090

Filed Jun. 27, 1983, Ser. No. 507,963
Int. Cl.³ B65D *85/67, 85/671*
U.S. Cl. 206—412 20 Claims



1. A transporting device for carrying a print, sheet or artistic canvas, comprising:

a liner having a pouch on opposite ends thereof for insertion of respective ends of a print, sheet or artistic canvas, said liner being comprised of flexible material for allowing said liner to be curled or wound into a generally spiral shape, so as to fit within a transporting tube;

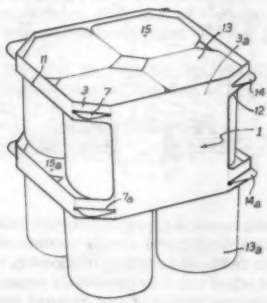
means for securing said wound liner and preventing said wound liner from unwinding; and

a hollow tube for carrying an inserted, wound and secured backing liner containing said print, sheet or artistic canvas.

4,467,918
LATERAL PACKAGING FOR HOLDING TOGETHER SUPERIMPOSED ARTICLES

Michel J. Blot, 6 rue de la Barboire, 85750 Moricq, France

PCT No. PCT/FR81/00127, § 371 Date Jun. 2, 1982, § 102(e) Date Jun. 2, 1982, PCT Pub. No. WO82/01177, PCT Pub. Date Apr. 15, 1982
PCT Filed Oct. 5, 1981, Ser. No. 387,845
Claims priority, application France, Oct. 3, 1980, 80 21273
Int. Cl.³ B65D *65/22, 71/00*
U.S. Cl. 206—430 8 Claims



1. Packaging means for assembling a plurality of articles in superimposed relation with an upper rim of each article disposed uppermost, said packaging means comprising a band of flexible material having opposite ends adapted for being connected together to hold the band around the superimposed articles, said band having at least two sets of slots extending longitudinally along said band in parallel, superimposed relation, said sets of slots being longitudinally spaced along said band to leave solid regions between said slots, said band having fold lines extending perpendicularly to said slots at the edges thereof to form borders for said solid regions, said band being

folded at said fold lines in surrounding relation to said articles with said rims of the articles engaged in respective sets of slots to hold said articles in suspended superimposed relation in which the top of the uppermost article and the bottom of the lowermost article are visible, said solid regions of said band forming flat bearing zones abutting against the superimposed articles, said band being provided with apertures in alternating solid regions in a location between the spaced sets of slots.

4,467,919

APPARATUS FOR THE SAFE-KEEPING OF SHEETS OF FILM

Tor L. J. Bengtsson, and Björn E. Ericsson, both of Box 7096, Halmstad, Sweden

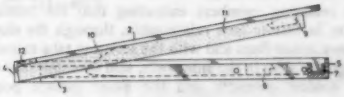
PCT No. PCT/SE81/00247, § 371 Date Apr. 7, 1982, § 102(e) Date Apr. 7, 1982, PCT Pub. No. WO82/00900, PCT Pub. Date Mar. 18, 1982

PCT Filed Sep. 3, 1981, Ser. No. 375,137

Claims priority, application Sweden, Sep. 4, 1980, 8006164

Int. Cl.³ B65D *81/30*; H05G *1/28*; G03B *41/16*

U.S. Cl. 206—455 **1 Claim**



1. An apparatus for the safekeeping of a sheet of film (14) before, during and after exposure thereof in, for example, an X-ray camera, said apparatus being in the form of a box (1) of great length and width and low height, said box (1) having an openable and closable lid (2), wherein the bottom (3) and at least one side wall (4), which preferably is a longitudinal side wall, are disposed in a unit with one another, the longitudinal side wall (4) consisting of a strip bent at a right angle to the bottom;

said lid (2) is fixedly disposed on said longitudinal side wall (4) by the intermediary of a film hinge device and, on the inner side, displays a compression pad (11) for compression of the film sheet (14) against the bottom (3) and said longitudinal side wall (4);

wherein the lid, at the oppposed edge in relation to the hinge means, has locking means for cooperation with locking means in the box.

4,467,920

BOOK SAFE

Thomas J. Smith, Hopewell Junction, N.Y., assignor to The Reader's Digest Association, Inc., New Castle, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,077

Int. Cl.³ B65D *5/56, 6/02*

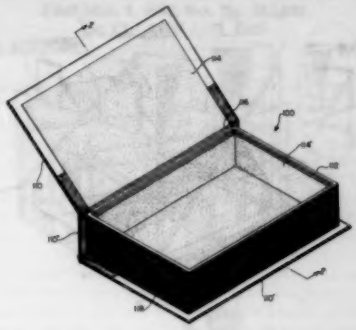
U.S. Cl. 206—457 **4 Claims**

1. A book safe comprising:

A. a cover, said cover including therein a movable front and an immovable back and connecting backbone therebetween;

B. a receptacle secured to the interior of the immovable back of the cover, said receptacle being reinforced on at least four sides thereof;

C. a blanket lining for the book safe, said lining overlying the interior of the front of the cover and the receptacle, in contiguous contact therewith, a portion of the lining adjacent the backbone, between the front of the cover and receptacle being detached from the front and receptacle,



adhering to a portion of the backbone to provide a delimiting hinge between the front and the receptacle.

4,467,921

VISUALLY CLEAR DENTIFRICE

Harry Greenland, West Ryde, Australia, and Edward S. Hodgetts, North Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 483,352, Apr. 8, 1983, abandoned. This application Sep. 21, 1983, Ser. No. 534,435

Int. Cl.³ A61K *7/16*

U.S. Cl. 206—524.4 **8 Claims**

1. A visually clear dentifrice contained in an unlined aluminium tube, said dentifrice comprising about 0.05–7.6% by weight of sodium monofluorophosphate, about 20–80% by weight of a liquid vehicle wherein about 70–100% by weight of said liquid vehicle is humectant and the remainder is substantially water, said liquid vehicle having a refractive index between about 1.44 and 1.47, about 0.02–10% by weight of gelling agent, about 5–50% by weight of an amorphous silica containing combined alumina polishing material having a refractive index similar to that of said liquid vehicle and a water soluble calcium salt in amount to provide about 5–40 ppm of calcium ion, said calcium ion serving to stabilise said visually clear dentifrice in an unlined aluminium tube.

4,467,922

SHEET SHIPPING CONTAINER HAVING DIAGONALLY SUPPORTED BACKWALL

James R. Rowley, Freeport, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 431,402

Int. Cl.³ B65D *19/00*

U.S. Cl. 206—597 **5 Claims**

1. A container of stacked glass sheets, comprising:

a plurality of glass sheets;

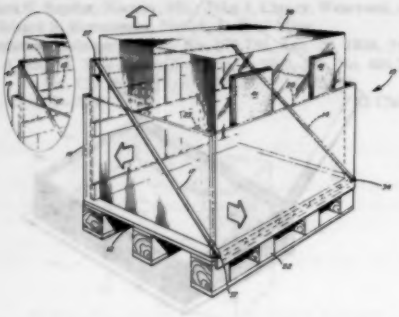
a rigid base;

an external fiberboard backwall member secured to said base;

an internal backwall member made of a material more rigid than fiberboard supported on said base in a vertical position, said internal and external backwall members each having a height less than the height of the sheets as stacked;

a pair of spaced elongated straps each having an end portion secured to upper half of the internal backwall member and the other end portion of each strap secured to front half of said base to limit pivotal movement of said internal backwall member away from the front half of said base

wherein said plurality of glass sheets are mounted on said base between said pair of straps; and



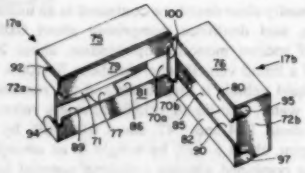
means for unitizing said plurality of glass sheets to provide the container with at least the sheets acting as a load bearing member.

4,467,923

DIVIDABLE DISPLAY AND SHIPPING CONTAINER

Arthur H. Dornbusch, and Robert W. Blaut, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 28, 1982, Ser. No. 392,833
Int. Cl.³ B65D 5/54
U.S. Cl. 206—602 **10 Claims**



1. A shipping container which is adapted to be divided into two subcontainers in use and form from a unitary blank comprising:

(a) a pair of side walls and a pair of end walls of generally equal height integrally connected in alternating side-by-side relation;

(b) a bottom closure flap integrally connected to each side wall and each end wall along a first score line;

(c) a top closure flap integrally connected to each side wall and each end wall along a second score line opposite said first score line;

(d) each of the bottom closure flaps which are attached to a side wall having a depthwise-extending medial slot therethrough which traverses its first score line and extends partially across the associated side wall;

(e) each of the bottom closure flaps which are attached to an end wall having a full-length retaining member integrally connected to its distal end along a third score line, said retaining member having a depth which is substantially smaller than the height of said walls such that upon division of said shipping container into two subcontainers said retaining member serves to contain product packed within a subcontainer while providing substantial access to such contained product;

(f) each retaining member having a securing tab located at each end and integrally connected along a fourth score line perpendicular to the third score line of the associated retaining member, the effective length of each tab being no greater than the distance by which the slots extend across the side walls; and

(g) a line of severance on each said side wall extending generally from the end of the slot therein across the balance of the side wall in alignment with said slot.

9. A shipping container which is adapted to be divided into two subcontainers in use and formed from a unitary blank having an outer surface and an inner surface, said shipping container comprising:

(a) a pair of side walls and a pair of end walls of generally equal height integrally connected in alternating relation and having top and bottom closures;

(b) the bottom closure having an inner minor flap extending inwardly from each side wall and an outer major flap extending inwardly from each end wall and adhesively united to the underlying minor flaps;

(c) said inner minor flaps each being divided into two equal sections by a slot which extends across its full depth and continues vertically into the associated side wall, said slots terminating at a distance from said bottom closure which is a minor portion of the height of the walls;

(d) said outer major flaps each having a full length retaining member integrally connected to its distal end, said retaining members each having a depth which is substantially smaller than the height of the walls and bearing a securing tab located at each end;

(e) said retaining members extending into the container interior, in face-to-face relationship, through the slots in the inner minor flaps and with the securing tabs extending through the slots in the side walls, said securing tabs each being folded inwardly and the inner surface portion thereof adhesively united with the outer surface portion of a side wall adjacent the slot through which it extends, whereby upon division of said shipping container into subcontainers, said retaining members serve to contain product packed within said subcontainers while providing substantial access to such contained product; and

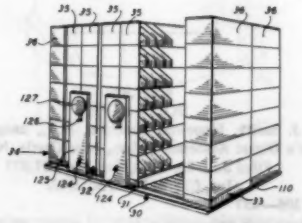
(f) a line of severance intermediate the ends of the slots, traversing the unslotted portions of the side walls and the top closure in alignment with the slots, said line of severance being adapted to permit separation of portions of the container lying on opposite sides of said line.

4,467,924

MOVABLE AISLE STORAGE SYSTEM

Bernard I. Morcheles, Short Hills, N.J., assignor to Stacor Corporation, Newark, N.J.

Filed Sep. 8, 1981, Ser. No. 300,306
Int. Cl.³ A47B 53/00
U.S. Cl. 211—1.5 **17 Claims**



1. A movable aisle storage system comprising

at least one deck panel;

a pair of rail and panel connector units disposed on opposite sides of said panel and extending along the length thereof, each of said units having

a rail portion, and

a support portion depending from said rail portion for support thereof, said support portion having

a support section shaped substantially as an inverted tee

with the web of said tee depending substantially vertically from said rail portion, and

a pair of flange sections extending upwardly and outwardly from the ends of the arms of said tee, each of said flange sections having a substantially horizontally extending portion for supporting one side of a deck panel thereon to provide vertical load bearing support for the deck panel;

means for securing each side of said deck panel to said substantially horizontally extending portion of the adjacent flange section of the connector unit associated with that side; and

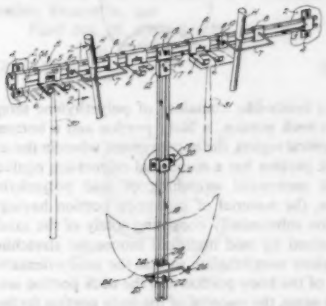
at least one movable carrier adapted to support storage equipment thereon, said carrier having wheels engaging said connector unit rail portions for rolling movement therealong.

4,467,925

WHEELBARROW AND GARDEN TOOL STORAGE RACK

Harry Ratzloff, P.O. Box 381, Turner, Oreg. 97392, and Jacob J. Reimer, 105 W. Vesper, Hesston, Kans. 67062

Filed Nov. 30, 1981, Ser. No. 325,851
Int. Cl.³ A47F 5/08
U.S. Cl. 211—60 T **3 Claims**



1. A combination wheelbarrow and garden tool storage rack for wall attachment, said rack comprising in combination,

a horizontal rack member, means for securing said rack member in abutment with a wall surface,

a vertical rack member in intersecting relationship with the horizontal rack member, connector means retaining the vertical rack member in intersecting relationship with said horizontal rack member, said connector means comprising C-shaped sleeves permanently secured to one another in perpendicular relationship, locking means carried by each of said sleeves and serving to secure a rack member and sleeve against movement,

tool supporting brackets slidably supported supported for selected positioning along the horizontal member of the rack,

sleeve mounted bails slidably supported by the horizontal rack member and positionable therealong to each receive a wheelbarrow handle and to retain same in outward spaced relationship to a rack supporting wall surface,

a wheelbarrow support slidably attachable to the vertical rack member and including an outwardly projecting support for the retention of the lip of a wheelbarrow pan, and

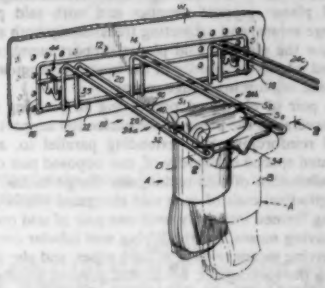
said sleeve mounted bails extending outwardly from said rack member a horizontal distance so as to support the wheelbarrow in spaced relationship to the wall to permit the storage of garden tools on said brackets between the wheelbarrow and the wall.

4,467,926

RACK SUPPLY SYSTEM

George Percival, 10 Twain St., Bloomfield, N.J. 07003

Filed Mar. 1, 1982, Ser. No. 353,635
Int. Cl.³ A47F 5/01, 5/08
U.S. Cl. 211—106 **9 Claims**



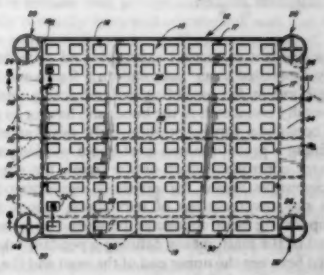
1. A rack supply system including a frame, at least a pair of track members sloping downwardly from said frame, hangers adapted to retain articles of merchandise in hanging condition, means for slidably mounting the hangers on the track members for movement between an upper loading position and a lower dispensing position, said slidably mounting means including each hanger having ends which engage different ones of a pair of track members, means to removably fix said frame to a vertical wall, said means including a pair of latches connected to said frame, each of said latches including a pair of hooks, one hook of each latch being adapted to fit into one of a group of regularly spaced apertures in a wall and the other hook on each latch being adapted to fit into a slot in a vertical standard on a wall.

4,467,927

MOLDED TRAY FOR DISPLAY STANDS

Walter Nathan, 1053 Skokie Ridge Dr., Glencoe, Ill. 60022

Filed Aug. 12, 1982, Ser. No. 407,460
Int. Cl.³ A47F 5/16
U.S. Cl. 211—153 **12 Claims**



1. A molded, plastic, unitary shelf member that is adapted for use as part of a display stand that is formed by a plurality of said shelf members that are vertically spaced apart by a plurality of tubular posts, comprising, in combination:

a rectangular, planar, horizontal, product-support member whose upper support surface is free of structural invasions into the support area thereof, so as to maximize the product-carrying capacity of said upper support surface;

a continuous, peripheral, transverse, reinforcing, flange means of rectangular configuration in plan, formed integrally along the entire exterior edgewise periphery of said

rectangular support member and projecting both above and below the plane of said horizontal support member, to provide both a rectangular, peripheral, side wall retainer for retaining goods carried on the upper surface of said support member and also to serve as peripheral shelf reinforcement against bending or twisting of the shelf member;

tubular, corner post-receiving, means formed integrally with said planar support member and with said peripheral flange means, and projecting transversely both above and below the plane of said planar support member, and located wholly outwardly of the inner, rectangular, surface of said reinforcing flange means;

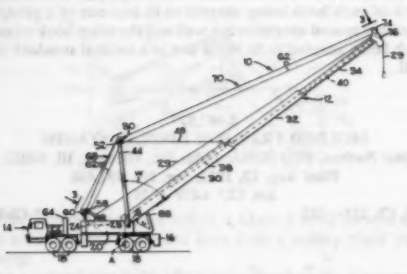
and a pair of elongated reinforcing strips lying in planes transverse to the plane of the horizontal support member, said reinforcing strips extending parallel to, and being located spaced outwardly of, one opposed pair of spaced, parallel sides of said rectangular flange means, with the longitudinal ends of each said elongated reinforcing strip being formed integrally with one pair of said corner post receiving means, for rigidifying said tubular corner post-receiving means relative to each other, and also for rigidifying the rectangular, horizontal, support member and its peripheral, transverse, reinforcing flange means.

4,467,928

PENDANT SUPPORTED BOOM WITH FIXED AND LIVE PENDANT PORTIONS

Bruce W. White, Nicholasville, Ky., assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 30, 1982, Ser. No. 393,983
Int. Cl.³ B66C *23/06*
U.S. Cl. 212—182 **6 Claims**



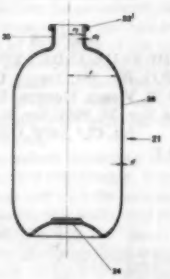
1. In a pendant supported extensible and retractable boom pivotally supported at an inner end on a frame and having an outer end, means for extending and retracting said boom, a mast pivotally connected to the boom and having an upper end pivoted between a stowed position and a raised working position defining a predetermined mast-boom working angle, and an operator controlled winch on the frame: the improvement which comprises means for pivotally supporting said mast adjacent the lower surface of said boom; means defining a boom supporting hoist connected between the frame and the upper end of the mast; means defining a pendant take-up hoist connected between the upper end of the mast and the outer end of the boom; means defining a live pendant trained around said winch and said hoist and forming a portion of both of said hoists; and a fixed pendant connected between said mast and said boom for establishing said predetermined mast-boom working angle; actuation of said winch in one direction being effective to controllably raise said mast from said stowed position to said mast-boom working angle and thereafter to raise the boom to a selected working angle, and actuation of said winch in the opposite direction being effective to controllably lower said boom and said mast into said stowed position, said live pendant having multiple parts of pendant line included in said boom supporting hoist and a lesser number of multiple parts of pendant lines included in said pendant take-up hoist in a proportion which will cause said boom hoist to have a greater mechanical advantage than that of the pendant take-up hoist for controllably raising the mast from or lowering the mast onto the boom.

4,467,929

ORIENTED PLASTIC CONTAINER

Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Löddeköpinge, both of Sweden, assignors to PLM A.B., Malmo, Sweden

Filed May 18, 1981, Ser. No. 264,829
Claims priority, application Sweden, May 29, 1980, 8004003; Dec. 10, 1980, 8008850
Int. Cl.³ B29C *17/07*; B29F *5/00*; B29C *5/06*; B65D *23/00*
U.S. Cl. 215—1 C **11 Claims**



1. In a bottle-like container of polyethylene terephthalate having a neck portion, a body portion and a bottom portion with a central region, the improvement wherein the material of said neck portion has a monoaxial orientation equivalent to a multifold monoaxial stretching of said polyethylene terephthalate, the material of said body portion having an axial orientation substantially consisting solely of the axial orientation obtained by said multifold monoaxial stretching of the polyethylene terephthalate so that the axial orientation of the material of the body portion and the neck portion are substantially the same, the material of the body portion further having a transverse orientation independent of and superimposed on said axial orientation by a multifold transverse stretching of said axially oriented polyethylene terephthalate, said transverse orientation by transverse stretching being obtained with the axial length of the material of the body and neck portions being substantially unchanged and without any axial stretching of the material of the body and neck portions.

4,467,930

OVERMOLDED CLOSURE SEAL

William J. Schnell, Wheeling; Thomas A. Fowles, McHenry, and Albert Henhapl, Rowling Meadows, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 6, 1982, Ser. No. 365,941
Int. Cl.³ B65D *1/02*
U.S. Cl. 215—32 **16 Claims**

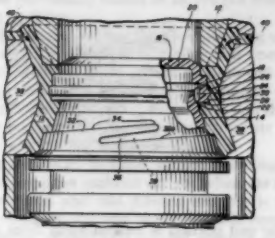
1. A sealing system for a container used for storing and dispensing liquids, said container including a neck defining a dispensing outlet surrounded by an annular lip, a closure for said outlet, and a frangible section coupling said closure to said neck, the improvement comprising, in combination:

said closure defining an outwardly extending bead;

said frangible section coupling said closure to said neck at a point below the plane of said dispensing outlet, to define an annular channel between said lip and said closure;

said neck having an annular overmold, said overmold having an inner surface in intimate, space-free contact with the outer surface of the closure and neck, said overmold

covering said neck and said bead and engaging said bead on said closure, whereby displacement of said overmold causes rupture of said frangible section permitting removal of said overmold and said closure from said neck.

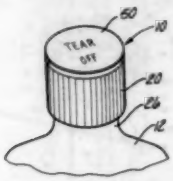


4,467,931

TAMPER INDICATING CLOSURE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Jun. 20, 1983, Ser. No. 505,794
Int. Cl.³ B65D *41/62*
U.S. Cl. 215—237 20 Claims



1. A tamper indicating closure comprising: a cap for permanent attachment to a container, said cap having a passage communicating with said container for dispensing the contents thereof, a closure element movable axially relative to said cap between positions opening and closing said passage, a tamper indicating element, and rivet means connected with said cap and passing through openings formed in said tamper indicating element, said tamper indicating element being fixed to said cap in close proximity to said closure element to prevent movement of said closure element.

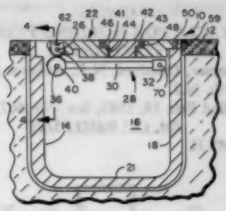
4,467,932

EASY LIFT PIT LID

Robert M. Dabich, 7212 Patterson Dr., Garden Grove, Calif. 92641

Filed Oct. 3, 1983, Ser. No. 538,187
Int. Cl.³ B65D *25/24*
U.S. Cl. 220—18 18 Claims

1. In a prefabricated pit for servicing an aircraft and formed with walls, a floor, and a lid rotatable about hinge means at the top of said walls and about a horizontal lid axis, the improvement comprising rotatable, counterweight means secured for rotation about a horizontal counterweight axis that is located below and parallel to said lid axis, and coupling means for rigidly joining said counterweight means to said lid to move said counterweight means below said lid in counter-rotation relative thereto.

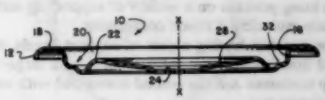


4,467,933

WARP RESISTANT CLOSURE FOR SANITARY CANS

Harlen E. Wilkinson, Crystal Lake, Ill., and Theodore Sopher, La Crescenta, Calif., assignors to American Can Company, Greenwich, Conn.

Filed Oct. 16, 1981, Ser. No. 311,910
Int. Cl.³ B65D *8/08*
U.S. Cl. 220—66 6 Claims



1. A warp resistant can body end closure of light gage metal configured to enhance warp resistance and resist distortion when subjected to differential pressures on opposite sides thereof, said end closure comprising,

a terminal peripheral flange at the outer periphery of the closure extending radially inwardly to a substantially horizontal flange crest prior to seaming said closure to a can body,

said crest merging into a first arcuate convex portion with said convex portion in turn merging into an axially downwardly extending countersink wall,

a concave arcuate wall portion extending downwardly and radially inwardly from said countersink wall and merging into a substantially planar shelf inwardly thereof,

said shelf at its innermost end merging into a convex outer arcuate wall portion extending downwardly and radially inwardly to an upwardly open concave countersink groove,

said groove from the bottom portion thereof extending radially and upwardly inwardly in a wall portion which merges into convex arcuate outer wall defining an upwardly directed reinforcing bead, the radially inner wall of said bead angling downwardly and merging into a downwardly inclined step panel,

said step panel at its innermost periphery merging into a planar central panel surrounding the longitudinal axis of said end closure,

said central panel being substantially parallel to said shelf, and substantially coplanar with the lowermost portion of said countersink groove, said central panel and said lowermost portion of said groove defining the lowest points of said end closure with respect to the interior of a said can body when seamed thereto,

said terminal peripheral flange having an outer curl for double seaming to a can body,

wherein said parallel relationship of said shelf and central panel on opposite sides of said groove and bead provide the antiwarp and distortion-free character of said end

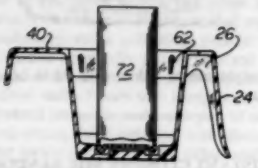
closure under varying ambient pressure conditions notwithstanding the light gage metal thereof.

4,467,934

RECEPTACLE FOR HOLDING PLURAL SIZE CONTAINERS

Gilbert C. Hummer, Cranford, N.J., assignor to Deka Plastics, Inc., Elizabeth, N.J.

Filed Feb. 18, 1983, Ser. No. 467,936
Int. Cl.³ B65D *25/28*
U.S. Cl. 220—85 H **8 Claims**



1. A receptacle for retention therein of a paper cup, plastic container, beverage can or the like and conformably nestable in a like receptacle for ready storage of such receptacle in a plural stack thereof, said receptacle being characterized further by convenient user hand holding and the mountability of same in hung position on a variety of supporting surfaces, said receptacle including a frame comprising

a base member having a pair of support levels, the first of said levels associated with support of a large size paper cup container and the second associated with support of a beverage can,

a skirt piece encircling said base member and upstanding a distance therefrom,

a second encircling skirt piece of relatively larger diametrical expanse spaced a distance above the first skirt piece, and

a pair of oppositively located connector pieces supporting said second skirt piece from said first skirt piece, both said skirt pieces tapering inwardly from their respective tops to bottoms whereby said frame telescopically can be received nestably in the frame of a like receptacle, and

a handle attached to said frame and including a first portion extending radially outwardly from said second skirt piece proximate the joinder location of one of said connector pieces with said second skirt piece, and a second downwardly depending portion laterally widening away a distance from said one connector piece to provide space therebetween receptive of a user's fingers when holding the receptacle, the handle being of relatively deep channel cross section opening toward said frame to provide enhanced handle rigidity.

4,467,935

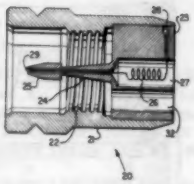
RANDOM COIL ULTRASONIC SEAL

Simon Backer, Toronto, and Michael T. Smith, Pembroke, both of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Oct. 21, 1983, Ser. No. 544,380
Claims priority, application Canada, Oct. 25, 1982, 414113
Int. Cl.³ B65D *53/00, 55/02*
U.S. Cl. 220—214 **6 Claims**

1. A seal comprising:

- a hollow stud member having pin receiving means within the stud member;
- a cap member having a body section and a pin element extending therefrom, the pin element having an end portion shaped for entering the stud member receiving means to be permanently secured therein, the cap member further having a random identity element fixed to the pin element end portion and the cap member body section such that the identity of the identity element is altered



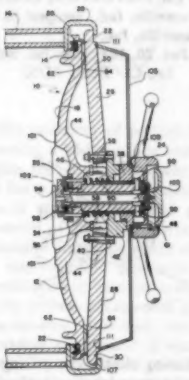
when the end portion is broken away from the pin element.

4,467,936

CLOSURE FOR A PRESSURIZED CHAMBER

Raju T. Makhijani, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Jul. 15, 1981, Ser. No. 283,538
Int. Cl.³ B65D *45/02*
U.S. Cl. 220—246 **5 Claims**



1. In a sealable closure for an opening in a chamber of the type including a door capable of assuming a confronting position in which a surface of the door confronts the chamber opening but in which the door is not sealed, a sealed position in which the chamber is sealed and an opened position in which the door is in neither the confronting nor sealed positions, a sealing device disposed between the door and the perimeter of the opening operable to effect a seal therebetween when the door is in its sealed position, and means for selectively preventing the door from leaving its confronting and sealed positions to assume its opened position, the improvement of means for operating the preventing means and for moving the door between its confronting and sealed positions comprising:

an operating member disposed on the door which operates the preventing means when said operating member is rotated in a plane parallel to the door and urges the door between its confronting and sealed positions when said operating member is moved in a direction having a component perpendicular to the door;

a driving member disposed on the door and adapted for rotational movement in a plane parallel to the door;

said driving member having an inclined surface adapted to contact an inclined surface of said operating member, said closure including contact ensuring means for ensuring said surfaces contact each other;

the resistance between said surfaces being sufficiently great

during at least a portion of the rotation of said driving member to enable said driving member to rotate said operating member and cause said operating member to cause the preventing means to secure the door in its confronting position;

said driving member inclined surface traveling up said operating member inclined surface after said operating member reaches a limit of its path of rotation and said driving member is rotated in a first direction thereby causing said operating member to move away from said driving member and causing the door to move from its confronting position and toward its sealed position;

said driving member inclined surface traveling down said operating member inclined surface when the door is in its sealed position and said driving member is rotated in a second direction, thereby permitting said operating member to move toward said driving member and cause the door to move from its sealed position to its confronting position; and

means for rotating said driving member.

4,467,937

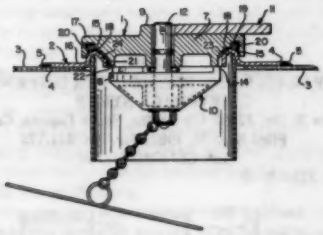
FILLER CAP ASSEMBLY

James R. Shaw, Amagansett, N.Y., assignor to Shaw Aero Devices, Inc., East Hampton, N.Y.

Continuation-in-part of Ser. No. 143,292, Apr. 24, 1980, abandoned. This application Nov. 17, 1981, Ser. No. 322,215

Int. Cl.³ B65D *45/00*

U.S. Cl. 220—246 **15 Claims**



13. A filler cap assembly for use with a tank having a wall defining a tank opening, the filler cap assembly comprising:

(a) an adapter including:

(1) an outside portion for connecting the adapter to the wall of the tank around the tank opening,

(2) an inside portion defining a central adapter opening, and

(3) a raised portion extending between the inside and outside portions of the adapter, the raised portion of the adapter having:

(i) a top, circumferential crest annularly extending around the adapter opening,

(ii) an outside surface extending downward and radially outward from the circumferential crest, and

(iii) an inside surface extending downward and radially inward from the circumferential crest,

the inside and outside surfaces of the raised portion being radially spaced from each other;

(b) a cap including:

(1) a base supported by the adapter and extending within the central opening thereof and having a radially extending flange defining an inside surface extending over and complementary to both the inside and outside surfaces of the raised portion of the adapter to inhibit distortion of the complementary fit between the raised portion of the adapter and the radial flange of the base, and

(2) retaining means attached to the base for securely connecting the cap to the adapter; and

(c) seal means attached to the base and engaging the raised portion of the adapter to inhibit fluid flow between the cap and the adapter said seal means normally spacing the complementary surfaces of the flange and adapter while permitting surface to surface engagement upon impact striking of said flange.

4,467,938

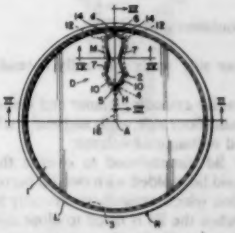
CLOSURE-OPENING DEVICE

David O. Allen, Wilmington, Ohio, assignor to Allen Tool Company, Inc., Wilmington, Ohio

Filed Aug. 25, 1983, Ser. No. 526,355

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—270 **16 Claims**



1. A closure-opening device for a container having side wall configuration and a closed bottom as well as a top capable of being opened for access to contents thereof including, for example, liquid, lard, shortening, shelled peanuts, granular or freeze dried or instant coffee, bread crumbs, powdered milk, salt, and other granular, coarse, as well as flake particles used by consumers, comprising:

a molded plastic closure member having a rim portion and a substantially flat surface panel portion;

a molded-in thinned-area portion including a circumferential score-line between the rim portion and the panel portion;

a raised surface, upwardly extending arrow-shaped tab element located substantially radially in the panel portion and also having a tab score around periphery of said tab element though terminating at opposite ends of the tab score at a pair of locations spaced inwardly a short distance from the circumferential score line on either side of said tab element;

a first included-angle point provided with said tab element and positioned radially inwardly toward a center location of the panel portion;

a further included-angle point provided with said tab element and positioned radially outwardly in a termination thereof closely adjacent, though spaced a short distance radially inwardly of the rim portion and circumferential score line; and

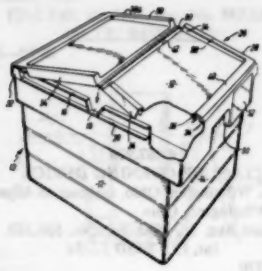
means for grasping said tab element after initial rupture by stress concentration of pressure applied to depress said tab element at said first included-angle point for easy initial rupture as well as for lifting said tab element upwardly from said panel portion for rupture of the circumferential score-line, the first included-angle point being defined in a sharper angle for stress concentration than a more blunt angle provided with the further included-angle point.

4,467,939

STORAGE CONTAINER WITH REMOVABLE LID

Michael J. Warwick, Northwich, England, assignor to WCB Plastics Limited, Winsford, England

Filed Oct. 26, 1982, Ser. No. 436,778
Int. Cl.³ B65D *43/14, 51/04*
U.S. Cl. 220—331 **9 Claims**



1. A lidded container comprising:
a floor;
opposed planar side walls upwardly extending from said floor;
opposed upwardly extending planar end walls between said side walls, said floor side walls and end walls enclosing an open topped rectangular volume;
a rectangular lid dimensioned to overlie the top of said container, said lid molded with two lid parts connected by a hinge region which extends transversely relative to said side walls when the lid is fitted to close said container;
a flange on an end wall of said container adjacent the upper edge thereof;
means on said lid adapted to engage the underside of said flange and to extend over the upper edges of said side and end walls, said lid being fittable to and removable from said container by combined pivotal movement about said hinge region and sliding movement relative to said container and parallel to said side walls to engage and disengage a part of said lid beneath said flange;
downwardly opening channels on said lid receiving the upper edges of said opposed side walls during fitting of the lid to the container;
recesses in the upper edges of said opposed side walls within which portions of the hinge region adjacent to said side walls are received when the lid is lowered into engagement with the upper edges of said side walls.

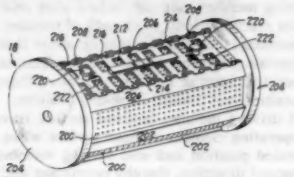
4,467,940

METAL FINISHING BARREL HAVING A SLIDING CLOSURE

Frank Little, Au Gres, Mich., assignor to Harshaw/Filtrol Partnership, Cleveland, Ohio

Division of Ser. No. 246,010, Mar. 20, 1981, Pat. No. 4,422,774. This application Sep. 23, 1983, Ser. No. 535,250
Int. Cl.³ B65D *43/20*
U.S. Cl. 220—345 **8 Claims**

1. A metal finishing barrel construction comprising:
(a) plurality of perforate side walls extending between a pair of circular end caps;
(b) a pair of spaced ribs extending lengthwise of said barrel and defining sides of a rectangular barrel opening;
(c) each of said ribs including a plurality of lips spaced longitudinally along said ribs;
(d) an access door for said barrel opening comprising:
(i) a perforate closure panel shaped to fit between said ribs to close said barrel opening;
(ii) a pair of latch plates overlying an outer face of said closure panel and slidable towards and away from each other;
(iii) each latch plate including a plurality of rigid tongues spaced along opposite sides of said plates that project beyond the side edges of the closure panel;



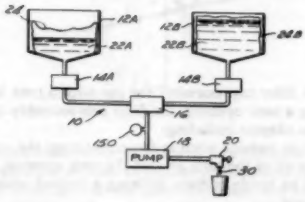
(iv) locking tongues dimensioned to fit between adjacent lips formed on said barrel ribs and engageable with said lips upon sliding movement in said latch plates in a predetermined direction;
(v) guide means for preventing skewed motion in said latch plates.

4,467,941

APPARATUS AND METHOD FOR DISPENSING BEVERAGE SYRUP

Benjamin R. Du, 32392 Via Antiba, South Laguna, Calif. 92677

Filed Sep. 30, 1982, Ser. No. 431,175
Int. Cl.³ G01F *11/08*
U.S. Cl. 222—1 **17 Claims**



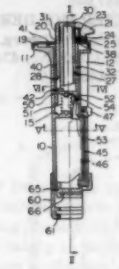
1. An improved beverage syrup dispensing apparatus comprising:
a reservoir adapted to store a quantity of beverage syrup;
a nozzle formed to dispense said quantity of said beverage syrup with a proportional quantity of a beverage mixing fluid;
a pump disposed between said reservoir and said nozzle for delivering said quantity of syrup from said reservoir to said nozzle;
means disposed between said reservoir and said pump for detecting the presence of air in said quantity of syrup;
said detecting means comprises a valve including a valve seat and valving member, said valving member adapted to remain spaced from said valve seat when said quantity of syrup is present in said valve to permit said quantity of syrup to flow across said valve seat and contact said valve seat when said quantity of syrup is not present in said valve to prevent any flow of air across said valve; and
switching means responsive to said detecting means for automatically discontinuing the operation of said pump upon the detection of air in said quantity of syrup.

4,467,942

REPEATING DISPENSER

Yuuji Oshikubo, 1-17-3, Nakashizu, Sakura-shi, Chiba-ken, Japan

Filed Apr. 29, 1982, Ser. No. 373,273
Int. Cl.³ G01F 11/06
U.S. Cl. 222—44 5 Claims



1. A dispenser for repeatedly dispensing uniform quantities of liquid comprising:

A. a tubular body having top and bottom ends, said body

(1) having attachment means at its bottom end for releasably securing thereto a cylinder of a cylinder piston device and

(2) having radially inwardly projecting stop means intermediate its top and bottom ends defining

(a) an upwardly facing abutment and

(b) a downwardly facing abutment;

B. a spring retainer in said body movable upward to and downward from a normal position engaging said downwardly facing abutment;

C. a spring reacting between said body and said spring retainer to bias the latter upward to its normal position;

D. an actuator slidable in said body,

(1) having a bottom end portion normally engaging said spring retainer, and

(2) having an upper end portion which projects above the top end of the body and provides a pressure button whereby the spring retainer can be moved downward from its normal position,

(3) said actuator comprising a member that is rotatably adjustable relative to the body and has at its bottom a plurality of circumferentially spaced axially stepped surfaces, each selectable by rotational adjustment of said member for engagement against said upwardly facing abutment to define one of a plurality of different distances through which the spring retainer can be moved downward from its normal position;

E. an elongated rack shaft lengthwise slidable upward and downward along a side surface of the body, said rack shaft

(1) having rack teeth spaced along its length that project inward relative to the body and

(2) having attachment means at a bottom end thereof for releasably securing thereto a piston of a cylinder piston device;

F. a pawl pivoted on said spring retainer to swing toward and from engagement with said rack teeth and biased in the direction for such engagement, for constraining the rack shaft to move downward with the spring retainer; and

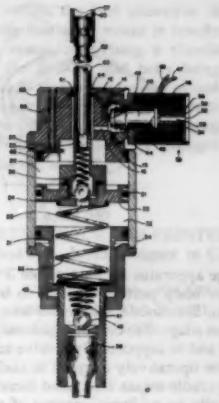
G. means on the body, engaged with the pawl when the spring retainer is in its said normal position, for holding the pawl in spaced relation to the rack teeth.

4,467,943

LIQUID DISPENSING VALVE ASSEMBLY

Clifford C. Carse, 500 Woodcrest Ct., Boulder City, Nev. 89005

Filed Jul. 15, 1982, Ser. No. 398,775
Int. Cl.³ G01F 11/06
U.S. Cl. 222—309 8 Claims



1. In a liquid dispenser in which liquid is alternately and selectively displaced from and drawn into a reservoir by a piston being driven therein between a first position in which the volume of said reservoir is expanded, and a second position in which said volume is contracted, said piston being urged to said first position by a piston biasing spring, and forced to said second position by pressurized gas in a chamber exposed to said piston, an improved assembly comprising:

a gas inlet for introducing pressurized gas into said chamber,

a first and a second outlet for releasing gas from said chamber,

a solenoid assembly having a solenoid plunger exposed to pressurized gas in said chamber, moveable between a first position for closing said gas inlet and a second position for closing said second outlet, and having a seat surface exposed to said second outlet,

plunger biasing means for urging said plunger to said first position,

solenoid means for moving said plunger to said second position and switching means cooperating therewith for momentarily energizing said solenoid means,

said second outlet having an oversized recess exposed in said chamber to said plunger seat surface and communicating to atmospheric pressure through said second outlet, said recess having an area exposed to said plunger seat surface sufficient to maintain said plunger in said second position by overcoming said plunger biasing means when said chamber is pressurized, and

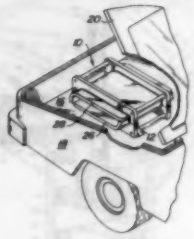
closure means cooperating with said piston for maintaining said first outlet closed until said piston has substantially reached said second position, whereby said first outlet is opened, the gas pressure in said chamber is released, and said plunger is returned to said first position by said biasing means.

4,467,944

STORAGE APPARATUS FOR AUTOMOBILE T TOP INSERTS

Gene F. Manko, 4125 Clearview Ter., West Palm Beach, Fla. 33409, and Henry J. Matrow, III, 4040 Gem Lake Dr., West Palm Beach, Fla. 33406

Filed Jul. 25, 1983, Ser. No. 517,078
Int. Cl.³ B60R 5/04
U.S. Cl. 224—42.42 **16 Claims**



1. Storage apparatus for automobile T top inserts, comprising, a lower body portion adapted to be coupled to a floor surface of an automobile, said lower body portion having first cradle means adapted to conform generally to an outer contour of an insert and to supportingly receive an insert, and an upper body portion operatively coupled to said lower body portion and having cradle means associated therewith adapted to conform generally to an outer contour of an insert, said cradle means associated with said upper body portion being disposed in contraposition to said first cradle means when said upper body portion is operatively disposed, and means for securing said upper body portion in operative disposition with respect to said lower body portion.

4,467,945

BABY CARRIER

Janice A. Schaapveld, 8414 - 14th Ave. South, Bloomington, Minn. 55420

Filed Dec. 23, 1983, Ser. No. 564,841
Int. Cl.³ A47D 13/02
U.S. Cl. 224—160 **14 Claims**

1. A baby carrier comprising a harness for attachment to an adult independently of and preliminary to placing a baby in the carrier, and a baby support panel fixed to the harness,

said harness comprising a waistband for fastening about the torso of an adult at or above the waist, and two shoulder straps fixed to the waistband at spaced locations for extending upward from the waistband along lateral portions of the upper frontal torso of an adult and over the shoulders and then in crossed relationship at the back of the upper torso of the adult, with the ends of the shoulder straps removably fastened to the waistband at lateral locations of the waistband as worn by an adult, each said shoulder strap having a shoulder level anchor element thereon at a location proximate to the portion thereof passing over the shoulder of an adult, and

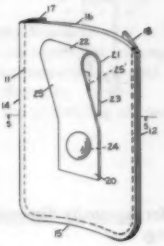
said baby support panel being characterized by the fact that it is fixed solely to the waistband of the harness of the adult, has leg openings proximate to said waistband, and includes fastening means extending from the lateral edges of the end of the panel most remote from the waistband for removably fastening the panel to the shoulder level anchor elements on the shoulder straps of the adult harness.

4,467,946

MICROMETER HOLDER

Joann Brown, 602 Jamestown St., Wattsburg, Pa. 16442

Filed Mar. 14, 1983, Ser. No. 474,824
Int. Cl.³ A45F 5/00
U.S. Cl. 224—252 **5 Claims**



1. A micrometer holder comprising a front curved sheet like member,

a rear curved sheet like member,

said front curved sheet like member having a peripheral edge made up of a first side edge, a second side edge, and a bottom edge,

said rear curved sheet like member having a peripheral edge made up of a first side edge, a second side edge, and a bottom edge,

said peripheral edges resting on one another,

said peripheral edges being sewed together holding said peripheral edges together,

said rear sheet member being curved about a first lesser radius of curvature than the second radius of curvature about which said front curved sheet like member is curved about, a belt loop attached to said rear member and located within its radius of curvature,

said radiuses of curvature having centers of curvature on the same side of said front and rear members whereby said curved sheet like members are held in nesting arched relation with a crescent shaped space therebetween for receiving a micrometer,

said front curved sheet member having a first shoulder and a second shoulder adjacent said peripheral edges extending toward the center of said holder generally perpendicular to said side edges a distance from said stitching approximately equal to the diameter of a handle of an ordinary micrometer,

an arcuate cutout in the upper end of said front sheet member defining a shoulder at each side thereof adapted to overlie the micrometer,

said belt loop having a first end attached to said rear sheet member in a position approximately one-fourth of the way from the upper edge to the lower edge of said rear sheet member,

said belt loop having a belt receiving part adjacent said upper edge,

said belt loop being formed by a strap extending upwardly from said first end,

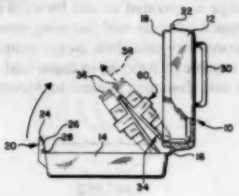
then downward overlying said first end and said lower end forming said belt receiving portion.

4,467,947

CONTAINER FOR CYLINDRICAL OBJECTS

William J. Minneman, c/o MTM Molded Products Company 5680 Webster St., Dayon, Ohio 45414

Filed Aug. 29, 1983, Ser. No. 527,135
Int. Cl.³ F42B 39/00; B65D 43/16
U.S. Cl. 224—253 14 Claims



1. A container for securely carrying therein a plurality of substantially cylindrical objects, comprising:

a housing having cooperating base and cover portions, each said portion having an interior and exterior surface;

first hinge means connecting said base and cover portions and defining a first hinge line, said housing being openable and closable by pivotal movement of said portions about said first hinge line;

first and second object support members;

second and third hinge means connecting said first and second support members to the interior of said base and cover portions, respectively, substantially near said first hinge means and defining second and third hinge lines substantially parallel to said first hinge line;

said first and second support members further being connected together along a portion of each of said support members; and

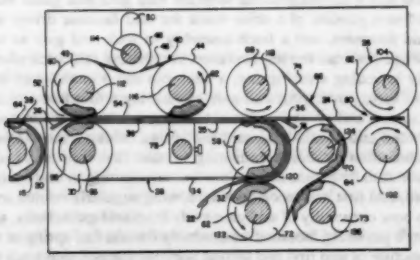
object securing means carried on at least one of said support members for removably securing a plurality of objects along said member.

4,467,948

WASTE STRIPPER

Clovis F. Deslauriers, 25-52 Borough Pl., Woodside, N.Y. 11377

Filed Jul. 29, 1982, Ser. No. 403,059
Int. Cl.³ B26F 3/00; B65H 35/10
U.S. Cl. 225—97 18 Claims



1. A waste stripper for removing automatically the waste from the usable portions of previously die-cut blanks comprising

a frame having lateral sides, an input end and a discharge end;

a feed conveyor supported on the frame and being adapted to carry the die-cut blanks from the input end toward the discharge end;

a stripping section supported on the frame near the discharge end and being positioned to receive the die-cut blanks from the feed conveyor, the stripping section comprising

support means to support the blank usable portions in a plane, and

stripping belt means to engage edge portions of the waste and to carry the engaged edge portions away from the plane;

discharge means to receive the blank usable portions from the support means and to discharge the usable portions at the discharge end; and

power means to function the feed conveyor, the stripping belt means and the discharge means in synchronism;

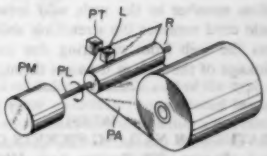
the stripping belt means comprising a plurality of three stripping belts, the first of said belts being rotatively driven by the power means, the second of said belts being in frictional engagement with and being rotatively driven by the first belt through a first frictional engagement area, the edge portions of the waste being engaged in the first frictional engagement area.

4,467,949

PAPER FEED DEVICE FOR PRINTER

Shinichi Nakata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,540
Claims priority, application Japan, Oct. 9, 1981, 56-161891
Int. Cl.³ B65H 25/02
U.S. Cl. 226—45 18 Claims



1. A paper feed device for a printer, comprising:

instructing means for instructing paper feed;

holding means for holding an instructed state established by said instructing means;

pulse generating means for producing a pulse train during the period the instructed state is held by said holding means;

driving means for driving feed of a paper sheet in response to production of the pulse train by said pulse generating means;

detecting means for detecting when a paper sheet fed by said driving means reaches a predetermined position; and

control means for releasing the instructed state held by said holding means upon detection by said detecting means of a paper sheet reaching the predetermined position.

4,467,950

ARRANGEMENT FOR PULLING THE TAIL OF A WEB-LIKE MATERIAL THROUGH A DRYING OR COOLING PLANT

Ingemar Karlsson; Percyval Svensson; Eric Nelenius; Göran Svensson; Axel Ydrefors, all of Växjö, Sweden, and Bengt Lindström, Takapuna, New Zealand, assignors to Flakt AB, Nacka, Sweden

Filed Aug. 25, 1982, Ser. No. 411,271
Claims priority, application Sweden, Aug. 27, 1981, 8105078
Int. Cl.³ G03B 1/36; F26B 11/02
U.S. Cl. 226—91 10 Claims

1. Apparatus for advancing the forward end of a web through a plant in which the web is subject to longitudinal shrinkage, said plant comprising:

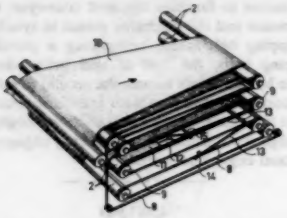
(a) a housing;

(b) a plurality of drivable rolls mounted in said housing in position so that the web runs zig-zag through said housing; and

(c) means for supporting the web on a curtain of air as it passes around said drivable rolls;

said apparatus for advancing the forward end of the web comprising:

(d) an endless member running in a separate path through said housing, the separate path being substantially parallel



to the path followed by the web and said endless member being driven such that the speed of said endless member is at least substantially the same as the surface speed of said drivable rolls, and

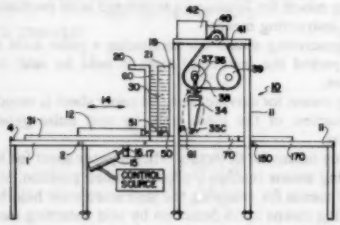
(e) means for attaching the forward end of the web to said endless member so as to transmit the pulling force of said endless member to the web, said means comprising an elastic cord member the stretching ability of which prevents the web from rupturing due to the longitudinal shrinkage of the web as it passes through the plant.

4,467,951

APPARATUS FOR NAILING PICKETS ON STRINGERS

Anthony L. Pagano, 909 Raritan Ave., Highland Park, N.J. 08904

Filed Jan. 15, 1982, Ser. No. 339,337
Int. Cl.³ B27F 7/02
U.S. Cl. 227—48 **10 Claims**



1. Apparatus for securing pickets transversely to elongated stringers, comprising:

a relatively horizontal work surface, hopper means located on the top surface of said work surface and adapted to hold a predetermined number of pickets in a vertical stacked relationship with respect to the top surface of said work surface,

a channel assembly located on said work surface and transverse to said hopper means and adapted to support at least one elongated stringer,

a carriage assembly mounted above said channel assembly and adapted to movably reciprocate with respect to said hopper always at given distance in a forward and backward direction,

means coupled to said carriage assembly to reciprocate the same said fixed distance to push one picket from said hopper to a fastening location,

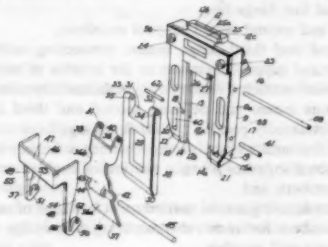
at least one fastening means located at said location and positioned above said picket, said fastening means operative to move in an arcuate path to contact said picket and to secure the same to said stringer when said arcuate path causes said fastening means to contact said picket when said carriage is operated in said forward direction at said given distance wherein said fastening means is coupled to a shaft means with said shaft means coupled to an eccentric gear capable of rotating to cause said shaft means and therefore said fastening means to traverse said arcuate path.

4,467,952

LATCH ASSEMBLY FOR THE FRONT GATE OF THE GUIDE BODY OF AN INDUSTRIAL FASTENER DRIVING TOOL

Robert F. Morrell, Jr., Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Jan. 3, 1983, Ser. No. 455,054
Int. Cl.³ B25C 1/04
U.S. Cl. 227—123 **8 Claims**



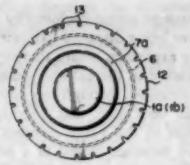
1. In a fastener driving tool of the type having a fastener-containing magazine, a reciprocating fastener driver, a guide body communicating with said magazine and having a front opening with a front gate closing said front opening, said gate having a first free end and a second end pivotally affixed to said guide body, said gate being swingable between an open position and a closed position wherein said gate and guide body define a portion of a drive track for said fastener driver and said fasteners, and a latch assembly to lock said gate in said closed position, the improvement comprising said latch assembly including a leaf spring, a latch pin and a latch lever, said leaf spring overlying said gate and having a first free end and a second end pivotally affixed to said guide body adjacent said second end of said gate, said leaf spring having a substantially planar first portion terminating in said first free end and a substantially planar second portion terminating in said second end, said first and second portions being angularly related so as to bow outwardly of said gate away from said guide body, said latch pin being mounted transversely on said leaf spring at the juncture of said first and second portions thereof, said latch pin having free ends extending beyond each side of sid leaf spring and said gate, said latch lever being U-shaped and having a base portion configured to be manually grasped and terminating in a pair of parallel spaced substantially identical legs, said legs terminating in free ends pivotally affixed to said guide body to each side of said leaf spring and said gate, said latch lever being manually pivotable between an open position and a closed position wherein said legs engage said latch pins ends compressing said leaf spring against said gate locking said gate in closed position.

4,467,953

COLD PRESSING METHOD

Toshio Yamamoto, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 19, 1982, Ser. No. 359,997
Claims priority, application Japan, Mar. 26, 1981, 56-43140
Int. Cl.³ B23K *20/02, 20/24*
U.S. Cl. 228—116 3 Claims



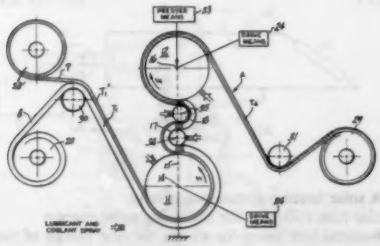
1. A cold pressing method which comprises the steps of:
forming a plurality of equidistant notches on an outside portion of annular sheets to be pressure welded for releasing stress formed due to plastic fluidity of parts of said sheets to be pressure welded;
superposing said sheets to be pressure welded; and
cold welding said parts of said sheets to be pressure welded.

4,467,954

PROCESS FOR OBTAINING A COMPOSITE ARTICLE

William L. Brenneman, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 5, 1981, Ser. No. 308,622
Int. Cl.³ B23K *20/04*
U.S. Cl. 228—117 8 Claims



1. A process for forming a well-bonded composite material, said process comprising:
providing a core material and a dissimilar clad material both in strip form;
providing a rolling mill having a plurality of rolls forming a plurality of roll bites, each of said roll bites being formed by two adjacent ones of said rolls and at least one of said rolls forming with respective other ones of said rolls more than one of said roll bites;
rotating each of said rolls forming each roll bite at a different peripheral speed;
applying a first back tension force having a first magnitude to said core material;
applying a second back tension force to said clad material, said second back tension force having a second magnitude different from said first magnitude;
said first and second back tension forces assisting in substantially preventing slippage between said core and clad materials and said rolls as said materials pass through said mill;
bringing said core and clad materials into abutting relationship prior to said materials entering a first one of said roll bites; and
rolling said core and clad materials together in an unheated condition to form said composite material, said rolling step comprising wrapping said abutting core and clad materials about an entry roll of said mill to assist in the application of said different back tension forces, passing said core and clad materials through said mill in a serpentine fashion and applying a compressive force to said rolls so that said core and clad materials undergo a plurality of reductions during each pass through said mill.

4,467,955

AXLE STUBBING JIG AND METHOD OF USE

Cecil L. Maupin, Jr., P.O. Box 490, Dodge City, Kans. 67801

Filed Sep. 8, 1982, Ser. No. 416,070
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—119 8 Claims

1. The method of stubbing an axle end of the type including a brake backing plate mounting flange spaced inward of the axle end, said method including supporting a gas cutting torch tip from said backing plate mounting flange for movement through a circular path coaxial with said axle end and with said tip spaced slightly outwardly of and facing inwardly toward said axle end, moving the gas cutting torch through said circumferential path to cut said axle end leaving a cut end of the axle projecting from said brake backing plate supporting an axle stub end from said mounting flange in coaxial relation with said axle and adjusting said axle stub end along the center axis of said axle into position where the inner end of the axle stub end at least closely juxtaposed to the cut end of said axle, spot welding the interface between the cut axle end the inner end of said axle stub end at points spaced circumferentially about the juxtaposed ends and thereafter completing a full circumferential weld about said juxtaposed end.

4,467,956

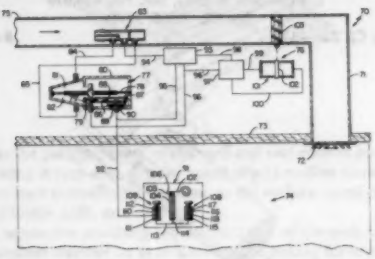
SYSTEM FOR SUPPLYING CONDITIONED AIR, THERMOSTAT THEREFOR AND METHODS OF MAKING THE SAME

Kenneth G. Kreuter, 1230 Centennial Dr., Thief River Falls, Minn. 56701

Filed Nov. 10, 1982, Ser. No. 440,517
Int. Cl.³ F24F *7/06*
U.S. Cl. 236—49 18 Claims

6. In a system for supplying conditioned air through duct means to an area to be treated by said conditioned air, said system comprising an area thermostat that tends to maintain the temperature of said area at a selected set point temperature of said thermostat, said thermostat having means providing a pneumatic signal in relation to the temperature sensed by said thermostat, a pneumatically operated damper means for controlling the flow of air from said duct means to said area, a controller having means for directing a pneumatic signal to said damper means to operate the same in relation to the pressure of said pneumatic signal of said thermostat and in relation to the air pressure in said duct means to compensate for pres-

sure changes originating elsewhere in the system whereby said controller tends to maintain the air flow to said area at the rate called for by said pneumatic signal of said thermostat regardless of the air pressure in said duct means, and adjustable maximum and minimum air flow rate setting devices for selecting the air flow rate range of said air flow from said duct means to said area under the control of said controller, the improvement wherein said adjustable maximum and minimum air flow rate setting devices are remote from said controller and are readily accessible in said area, said maximum and mininum air flow rate setting devices being operatively associated with said thermostat to select the pressure range of said pneumatic signal thereof and, thus, the range of the rate of the air flow from said duct means, said thermostat having a housing means, said maximum and minimum air flow rate setting devices being



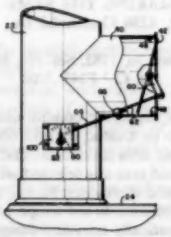
disposed in said housing means, said thermostat having a bleed means that determines the pressure value of said pneumatic signal thereof, said thermostat having passage means for interconnecting a pneumatic source and said controller to said bleed means, said maximum and minimum air flow rate setting devices comprising valve means interconnected to said passage means, said minimum air flow rate setting device effectively disconnecting said bleed means from said passage means when said bleed means causes the pressure in said passage means to fall to a pressure value that corresponds to the pressure value setting of said minimum air flow rate setting device, said maximum air flow rate setting device effectively venting said passage means when the pressure in said passage means rises to a pressure value that corresponds to the pressure value setting of said maximum air flow rate setting device.

4,467,957

FLUE FLOW REGULATOR

Frederick C. Bucheit, R.D. #1, Box 217, Beech Creek, Pa. 16822

Filed Sep. 29, 1982, Ser. No. 427,825
Int. Cl.³ F23N *5/04*
U.S. Cl. 236—96 **9 Claims**



1. A temperature-dependent flow regulator for a combustion exhaust flue, comprising:

a vent pipe connected to the flue, one end of the vent pipe opening in the flue and the opposite end of the vent pipe opening in a free air space;

a valve member mounted in the vent pipe at a distance from the flue to effectively prevent contact between exhaust gases in the flue and the valve member, the valve member being movable over a range of positions from fully open to closed, to promote, retard and block air flow through the vent pipe and into the flue to control the rate of combustion;

thermostatic expansion means enclosed by a heat conductive cover, the cover being disposed exteriorly of and directly on the flue, the expansion means thereby accurately sensing the temperature of the exhaust gases in the flue; and,

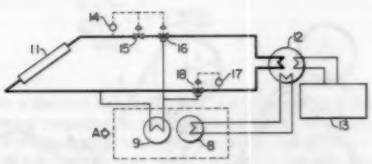
a rigid linkage extending through the cover, outside of the flue and of the vent pipe, and directly connecting the expansion means to the valve member and operable to drive the valve member closed at a predetermined low temperature of the exhaust gases in the flue, blocking flow in the vent pipe, and operable to position the valve member over the range of open positions at progressively higher temperatures of the exhaust gases in the flue, whereby combustion temperature is precisely controlled and all parts of the regulator are completely protected from exhaust gas damage.

4,467,958

SOLAR-HEATING SYSTEM

Masao Yoshiwa, Kobe; Yoshiro Hujioka; Masakuni Tokai, both of Hyogo, and Mikio Muro, Akashi, all of Japan, assignors to Ministry of International Trade and Industry of Japan, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,460
Claims priority, application Japan, Jun. 23, 1982, 57-106960
Int. Cl.³ G05D *23/00*
U.S. Cl. 237—2 B **2 Claims**



1. A solar heating system comprising:

a solar heat collector for collecting solar energy;

a chemical heat pump for storing thermal energy of the sun collected by said solar heat collector as energy in the form of a difference in the concentration of an aqueous chemical solution, said chemical heat pump comprising an evaporator actuated by the stored thermal energy of the sun, and an absorber;

a heat source for generating thermal energy other than the thermal energy of the sun;

first line means for allowing warm water to flow between said solar collector, said chemical heat pump and a heating load in circulation; and

second line means for allowing a heating medium to flow between said chemical heat pump and said heating load;

control means mounted in said first line means for sensing the temperature of warm water flowing through said first line means and controlling the flow rate and the flow channel of the warm water; wherein the improvement resides in that:

said control means is operative (a) to sense an outlet temperature of said solar collector and, when said outlet temperature exceeds a predetermined heating temperature level, to allow the warm water released from the solar heat collector to flow directly to the heating load and, when the outlet temperature of the heating load exceeds a preset

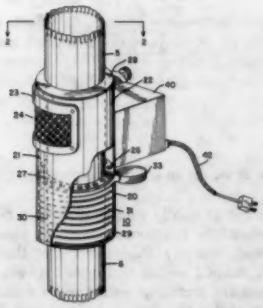
temperature level, to allow the warm water released from the heating load to flow directly to the solar heat collector without passing through said heat pump; (b) to allow, when the preset temperature level is not exceeded, the warm water released from the heating load to flow through a line of said first line means extending through the evaporator of the chemical heat pump to raise the temperature of the heating medium in said second line means extending through the absorber of the chemical heat pump until the outlet temperature of the heating load reaches the preset temperature level, to supply pumped heat to the heating load again while returning the warm water flowed through the evaporator to the solar heat collector; (c) to apply, when the temperature of the warm water released from the solar heat collector at the outlet thereof is below the predetermined heating temperature level and the temperature of the heating medium does not reach the predetermined heating temperature even when the warm water is allowed to flow through said line of said first line means extending through the evaporator of the heat pump to heat the heating medium by means of the heat pump, said heat source for generating thermal energy other than the thermal energy of the sun to the heating load simultaneously as said solar collector is operated; and (d) to allow, when it is impossible to collect heat by means of the solar collector, heating to be carried out by using only said heat source generating thermal energy other than the thermal energy of the sun.

4,467,959

HEAT EXCHANGER AND VAPORIZER FOR A STOVE FLUE

Charles F. Laviguer, McCall, Id., assignor to Progressive Energy Systems, Inc., Minn.

Filed Mar. 14, 1983, Ser. No. 475,016
Int. Cl.³ F24B 7/00
U.S. Cl. 237—55 **5 Claims**



1. A heat exchanger for a stove flue comprising:

an elongated flue-gas conducting inner tube provided on opposing ends with means for connection with an existing flue;

a hollow tubular casing attached to and enveloping said inner tube, said casing including an inlet and an outlet for airflow therethrough; and

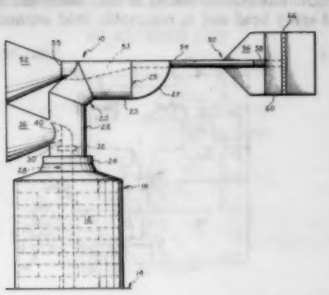
liquid vaporization means contained within said casing, said vaporization means including a liquid container in heat exchange contact with said inner tube, said liquid container having a helically coiled pipe sealed at its lowermost end and terminating at its uppermost end into a pour spout located exteriorally of said casing, said coiled pipe provided upon its uppermost surface with a plurality of vapor vents for conducting vapor from said helical pipe through the hollow of said casing and through said outlet for auxiliary space heating and conditioning.

4,467,960

COMBINATION WEATHERVANE HEAT EXCHANGER

Howard E. Doyle, Jr., P.O. Box 821, Chicopee, Mass. 01014

Filed Dec. 14, 1983, Ser. No. 561,305
Int. Cl.³ F24B 7/00
U.S. Cl. 237—55 **5 Claims**



1. A heat-recovery apparatus comprising:

(a) an exhaust gas flue pipe having a passage therethrough for connection to a source of hot gasses;

(b) said flue pipe terminating in an inverted, substantially L-shaped end segment, wherein said end segment has a substantially horizontal exhaust leg with an exhaust opening for said flue pipe;

(c) means for rotatably mounting said end segment above the roof line of a structure;

(d) a fresh air intake pipe of smaller diameter than said flue pipe and positioned within said flue pipe;

(e) said fresh air intake pipe having a vertical section and a substantially horizontal section that extends outwardly through said flue pipe and acts as an intake for said fresh air pipe;

(f) means for rotatably supporting the vertical section of said fresh air intake pipe within said flue pipe such that the fresh air intake pipe is rotatable with said flue pipe; and

(g) weathervane means to control the rotation of said flue pipe and said fresh air intake pipe in response to wind pressure and direction, such that the intake of said fresh air pipe faces directly into the wind when the wind pressure is below a predetermined value and is turned away from the full face of the wind when the wind exceeds the predetermined value, said weathervane means including a main vane air pipe having one end secured to the horizontal leg of the exhaust flue pipe and an opposite end secured to a vane, and a conical air scoop which extends outwardly through said flue pipe and is connected in fluid communication to said main vane air pipe, whereby air flows through said air scoop and said main vane air pipe and against the vane to cause said fresh air pipe to rotate when the wind pressure exceeds the predetermined value so that the intake of said fresh air pipe is turned away from the full force of the wind.

4,467,961

CONTAINER AND SPRAYING SYSTEM

Ronald A. Coffee, Haslemere; Leonard E. Houghton, Petworth; Peter C. Bennett, Churt, and Graham C. Johnson, Hindhead, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Feb. 11, 1982, Ser. No. 348,087
Claims priority, application United Kingdom, Feb. 12, 1981, 8104314; Apr. 3, 1981, 8110543
Int. Cl.³ A01M 7/00; B05B 5/02
U.S. Cl. 239—1 **35 Claims**

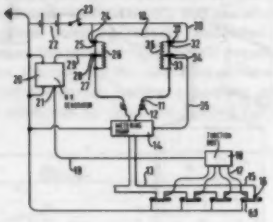
1. An agricultural liquid spraying apparatus comprising:

a liquid container including a liquid output port and a pre-set

electrical circuit having at least one electrically-sensible parameter which is pre-set to represent a pre-determined spray application rate for the intended liquid filling of the container;

at least one spray head adapted to spray liquid supplied thereto;

fluid flow rate control means in fluid communication with said spray head and in removable fluid connection with



said liquid output port of the container for withdrawing liquid from the container and supplying same to said spray head at a controlled rate; and

electrical control means in removable electrical signal communication with said pre-set electrical circuit and electrically connected to control said fluid flow rate control means in accordance with said preset electrically sensible parameter.

4,467,962

LAND IRRIGATION SYSTEM AND METHOD

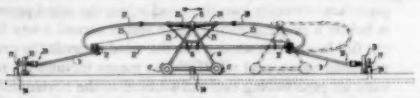
Allen T. Noble, Boise, Id., assignor to Noble Linear Irrigation, Inc., Boise, Id.

Continuation of Ser. No. 275,273, Jun. 19, 1981, abandoned, which is a continuation of Ser. No. 80,060, Sep. 28, 1979, Pat. No. 4,274,584, which is a continuation-in-part of Ser. No. 887,792, Mar. 17, 1978, abandoned. This application Sep. 13, 1982, Ser. No. 417,037

The portion of the term of this patent subsequent to Jun. 23, 1998, has been disclaimed.

Int. Cl.³ A01G *25/09*; F16L *27/08*

U.S. Cl. 239—1 **8 Claims**



2. In the operation of a land irrigation system including an elongated water main having a plurality of outlet valves located in hydrants projecting from the water main at spaced points along its length and an elongated water sprinkling line extending laterally to and movable along the water main, a method of supplying water under pressure from the water main to the sprinkler line comprising:

propelling a tractor in a direction along the water main at a rate substantially equal to the rate of movement of the sprinkler line;

supporting the inner ends of each of a pair of elongated water conduits to allow relative movement of said inner ends in a substantially horizontal plane in a direction generally along the water main and to allow relative movement between the respective water conduits in the direction of the water main, with the water conduits extending outwardly in generally opposite directions along the water main;

supporting the outer end of each of the water conduits in association with a pair of driven wheeled carriages;

providing an outlet valve coupling mechanism on the respective carriages and in association with the outer end of each water conduit for establishing water flow connection with the outlet valves in the hydrants on the water main;

driving the wheels of each wheeled carriage to move the water conduit longitudinally of the water main to successively engage the outlet valve coupling mechanism with the respective outlet valve along the length of the water main, the step of driving the wheeled carriages including driving such wheeled carriages alternately of one another during the propelling of the tractor;

coupling the inner ends of the water conduits to the sprinkler line to provide a water flow path therebetween; and

successively connecting and disconnecting the respective outlet valve coupling mechanisms with the outlet valves along the length of the water main and continuously maintaining at least one of the outlet valve coupling mechanisms connected to an outlet valve to supply water under pressure to the water conduit associated therewith.

4,467,963

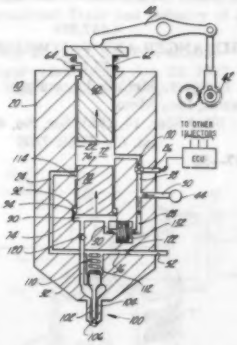
SINGLE DUMP SINGLE SOLENOID FUEL INJECTOR

Albert E. Sisson, and Edward J. Hayes, both of Farmington Hills, Mich., assignors to The Bendix Corporation

Continuation of Ser. No. 364,816, Apr. 2, 1982, abandoned. This application Jan. 24, 1984, Ser. No. 572,975

Int. Cl.³ F02M *47/02*

U.S. Cl. 239—90 **7 Claims**



1. A fuel injector for an internal combustion engine comprising:

a body having an axially extending bore, a pumping piston and a remotely positioned metering piston positioned within said bore for axial movement therein; a timing chamber defined within said bore between the pumping piston and the metering piston and a metering chamber defined between the metering piston and the lower portion of the bore;

a first fuel passage having an electronically controlled valve situated therein for receiving pressurized fuel and for transmitting the fuel to the timing chamber and for establishing, when closed, a hydraulic link between said pumping piston and said metering piston;

a second fuel passage for receiving pressurized fuel and for transporting the received fuel to the metering chamber;

a pressure regulator situated in said second fuel passage for regulating the fuel pressure within said metering chamber at a predetermined level between the pressure level of said received pressurized fuel and the pressure level established in said timing chamber during the interval when said valve is closed and said pumping piston is retracting, said pressure regulator including means for preventing reverse fuel flow from the metering chamber to said second fuel passage;

a spring chamber situated remote from the metering chamber;

nozzle means situated remote from said metering chamber and partially extending into said spring chamber for selectively releasing fuel therefrom;

biasing means located within said spring chamber for biasing said nozzle means in a closed position during non-injecting modes of operation;

fuel passage means for providing a means for relieving pressure within the timing chamber thereby breaking said hydraulic link as said metering piston uncovers said fuel passage means as it is moved into said metering chamber under the influence of said pumping piston and for developing a hydraulic biasing force to further bias said nozzle means toward a closed condition to terminate the injection of fuel therefrom.

4,467,964

AUTOMATIC MIXING DEVICE FOR USE IN A SHOWER HEAD

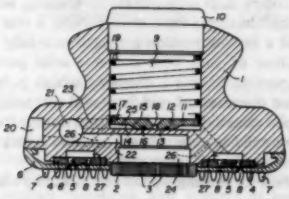
Charles Kaeser, 18, chemin de Rennier, Pully, Switzerland

Filed Oct. 19, 1981, Ser. No. 312,704

Claims priority, application Switzerland, Nov. 19, 1980, 8552/80

Int. Cl.³ B05B 9/03

U.S. Cl. 239—312 **20 Claims**



1. A mixing device for mixing a first fluid with a second fluid, said second fluid being contained in a pressurized stream, said mixing device comprising a housing including second fluid inlet means, second fluid outlet means, second fluid conduit means for directing said second fluid stream from said second fluid inlet means to said second fluid outlet means, and a first fluid chamber within said housing for holding a predetermined quantity of said first fluid, said first fluid chamber including a closure surface, an inlet, and an outlet, and said mixing device further comprising membrane means slidably contained within said first fluid chamber, said membrane means including a first surface in contact with said first fluid within said first fluid chamber, a second surface facing said closure surface, and an orifice connecting said first and second surfaces so that said first fluid can flow out of said first fluid chamber through said orifice, bias means in contact with said first surface of said membrane means so as to normally urge said second surface of said membrane means against said closure surface so as to prevent the flow of said first fluid through said orifice, second fluid control means for selectively directing at least a portion of said second fluid stream through said inlet of said first fluid chamber against said second surface of said membrane means so as to urge said membrane means against said bias means to thereby separate said second surface of said membrane means from said closure surface and expose said orifice, thereby permitting any of said first fluid contained within said first fluid chamber to flow through said orifice so long as said second surface of said membrane means is separated from said closure surface and mix with said second fluid to create a fluid mixture, and fluid mixture conduit means for directing said fluid mixture from said outlet of said first fluid chamber to said second fluid outlet means.

4,467,965

FUEL INJECTION NOZZLES

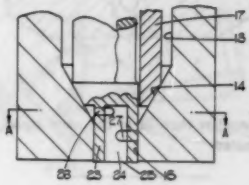
Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 21, 1983, Ser. No. 487,152

Claims priority, application United Kingdom, Jun. 19, 1982, 8217830

Int. Cl.³ B05B 1/34

U.S. Cl. 239—464 **4 Claims**



1. A fuel injection nozzle for supplying fuel to a combustion chamber of a compression ignition engine, comprising a bore, a seating defined in the bore and a valve member shaped for co-operation with the seating and movable away from the seating by the action of fuel under pressure supplied to the bore, to allow fuel flow through an outlet, a guide bore extending from said seating to the exterior of the nozzle, an extension on said valve member, said extension being slidable within said guide bore, a chamber defined in said extension, said chamber having an open end defining the outlet to the exterior of the nozzle, a first flow passage in the extension, said first flow passage opening into said chamber at a position so that fuel flowing therethrough when the valve member is lifted from its seating will swirl in one direction in said chamber, thereby to cause the fuel spray leaving said outlet to be of bushy form, and a second flow passage in the extension, said second flow passage being arranged to be progressively uncovered as the valve member moves away from the seating, said second flow passage being disposed so that fuel flowing therethrough cancels the swirl produced by the first flow passage thereby to cause the fuel to leave said outlet in the form of a jet.

4,467,966

FUEL-INJECTING VALVE FOR INTERNAL COMBUSTION ENGINE

Eckart Mueller, Schwabach, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nürnberg, Fed. Rep. of Germany

Continuation of Ser. No. 115,948, Jan. 28, 1980, abandoned. This application Nov. 17, 1981, Ser. No. 322,256

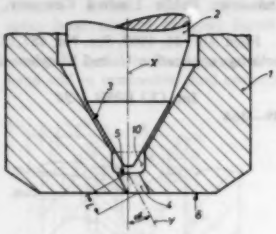
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 2902417

Int. Cl.³ F02M 61/06, 61/18

U.S. Cl. 239—533.4 **4 Claims**

1. A fuel injector for internal combustion engines in which an axially slidable single nozzle needle is provided in a nozzle body, said nozzle needle being capable of being lifted off its valve seat by the pressure of the fuel with a single contact cross-section spray hole provided in the nozzle body extending at an acute angle relative to the injector axis characterized in that the angle between the injector axis and the spray hole axis is between 10° and 50° and in that the length of the spray hole axis measured from the penetration area on a blind hole or valve seat respectively to the outer face of the nozzle body is selected so that when looking through the spray hole in the

direction of the injector axis, at least 20% of the full spray hole area appears as a free area, the length of the spray hole axis



being selected smaller than or at the most equal to twice the spray hole diameter.

4,467,967

MANURE SPREADERS

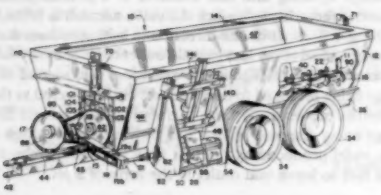
Mervin G. Martin, Myerstown, Pa., assignor to Hedlund Manufacturing Co., Inc., Boyceville, Wis.

Continuation-in-part of Ser. No. 170,034, Jul. 18, 1980, Ser. No. 172,976, Jul. 28, 1980, Pat. No. 4,362,272, and Ser. No. 310,046, Oct. 9, 1981,. This application Nov. 20, 1981, Ser. No. 323,274

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.³ A01C *23/00*

U.S. Cl. 239—662 **8 Claims**



1. A manure spreader including:

a container having converging sidewalls for holding manure to be spread;

an auger arranged for rotation within said container to propel manure to an opening in said container;

a first drive system connected to the auger to rotate said auger at a first, slow, rotative speed;

said container having an opening to provide an outlet through which manure can exit from said container;

spreader means positioned outwardly adjacent to the opening in said container to receive manure and to spread the manure in a spray pattern;

said spreader means comprising a chamber and a spinner, said spinner including a shaft and being adapted for rotation within said chamber to propel manure in a spray pattern, said spinner being adapted to rotate at a second, fast, rotative speed, said spinner comprising a plurality of manure blades, said manure blades pivotably mounted so that rotation of said spinner at a second, fast rotative speed provides sufficient centrifugal force to extend the manure blades radially outward so that rotation of said plurality of manure blades at the second, fast, rotative speed is operable to spread manure onto a field; and

a second drive system interconnected between said first drive system and said spinner to rotate said spinner at a second, fast, rotative speed.

4,467,968

ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

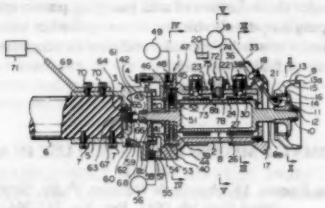
Teru Morishita, Shizuoka; Satoshi Ohtawa, Mishima; Yoshimichi Ishioka, Susono, and Toshikazu Suzuki, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 15, 1981, Ser. No. 302,452

Claims priority, application Japan, Mar. 4, 1981, 56-29949

Int. Cl.³ B05B *5/04*

U.S. Cl. 239—703 **21 Claims**



1. A rotary type electrostatic spray painting device comprising:

a metallic housing;

a metallic rotary shaft arranged in said housing, said metallic rotary shaft having a front solid portion, a rear solid portion, and a hollow portion arranged coaxially with, and intermediate of, said front and rear solid portions, said hollow portion having a diameter which is larger than respective diameters of said front and rear solid portions;

a cup-shaped metallic spray head fixed onto a front end of said front solid portion of said metallic rotary shaft and having a cup-shaped inner wall;

feeding means for feeding a paint onto said cup-shaped inner wall;

drive means cooperating with said metallic rotary shaft for rotating said metallic rotary shaft;

a pair of non-contact type radial bearings arranged in said metallic housing and cooperating with said hollow portion of said metallic rotary shaft for radially supporting said metallic rotary shaft under a non-contacting state;

permanent magnet means arranged near a circumferential outer wall of said hollow portion of said metallic rotary shaft and mounted on said metallic housing at a position on only one side of said shaft located in the vicinity of only a circumferential portion of said hollow portion of said metallic rotary shaft between said pair of non-contact type radial bearings for applying a substantially unidirectional radial attractive magnetic force to said metallic rotary shaft which counteracts at least a portion of a gravitational force acting on said metallic rotary shaft when the housing is oriented so that the rotary shaft is substantially horizontal and the magnet means is disposed above the shaft, said circumferential portion of said hollow portion of said metallic rotary shaft being made of a ferromagnetic material;

adjustment means for adjusting the radial distance between said permanent magnet means and said ferromagnetic circumferential portion of the metallic rotary shaft, said adjustment means being accessible from the exterior of said metallic housing;

terminal means for receiving a negative high voltage, said terminal means being electrically connected to said metallic housing; and

electrode means arranged in said metallic housing for electrically coupling said terminal means to said cup-shaped metallic spray head.

4,467,969

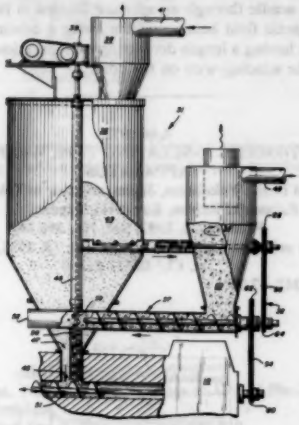
ON-LINE RECLAIM SYSTEM

Jack F. Godfrey, and Charles L. Grant, both of Hazlehurst, Ga., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 41,606, May 23, 1979, Pat. No. 4,353,851, which is a continuation of Ser. No. 848,742, Nov. 4, 1977, abandoned. This application Mar. 1, 1982, Ser. No. 354,191

Int. Cl.³ B02C 23/72

U.S. Cl. 241—101 B 8 Claims



1. In an on-line system for reclaiming a portion of oriented and unoriented film produced on an extrusion line, wherein at least one carrier stream transfers said portion of said film to a means for both entangling said oriented and unoriented film to form a collection thereof containing at least 25% by weight of unoriented film and chopping said collection to form a chopped reclaim therefrom, and wherein at least one other carrier stream transfers said chopped reclaim to a means for transferring both virgin resin and said chopped reclaim to a means for plasticizing such materials which is a part of said line, an improvement to said means for transferring both virgin resin and said chopped reclaim comprising: a first container which is suitable for storage of a virgin resin and is adapted to transfer a first and second part of said virgin resin, a second container which is adapted both to separate incoming chopped reclaim from said at least one other carrier stream and to induce mixing of any virgin resin simultaneously entering therein, a first means for transferring which is adapted to transfer a first part of said virgin resin from said first container to said second container in such a manner that said virgin resin and said chopped reclaim which simultaneously enters therein become intermixed so as to form a mixture therein, wherein a second means for transferring is adapted to transfer said mixture from said second container to said means for plasticizing, and wherein a third means is adapted to transfer said second part of said virgin resin from said first container to said means for plasticizing at a location downstream from where said mixture enters said means for plasticizing.

4,467,970

APPARATUS FOR CUTTING PLANT MATERIALS, IN PARTICULAR TOBACCO

Franz Sagemüller, Bockhorn, Fed. Rep. of Germany, assignor to Franz Sagemüller GmbH, Bockhorn, Fed. Rep. of Germany

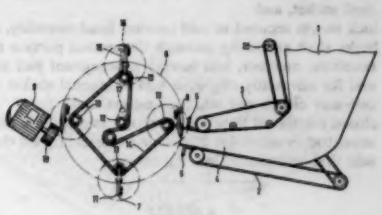
Filed Jul. 13, 1982, Ser. No. 397,932

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127697

Int. Cl.³ B02C 18/18

U.S. Cl. 241—101.2 17 Claims

1. In an apparatus for cutting plant material of the type having a funnel-shaped press having an outlet end in which the charged material to be cut is compressed, a mouthpiece arranged at the outlet end of the press to which the compressed material is fed, a rotatable knife carrier disposed in front of the mouthpiece and having a plurality of circulating knives having cutting edges which may be moved past the mouthpiece so as to perform a cutting action, and a knife-grinding device disposed in the circulation path of the knives having a grinding wheel disposed for operative passing engagement with an



oblique knife surface of a knife face of the cutting edge of each knife which, when emerging from the mouthpiece, faces away from the material to be cut, the improvement comprising:

a plurality of elastically resilient counter knives disposed on said mouthpiece which project into the circulation path of the cutting edges of said knives, said counter knives being disposed on said mouthpiece to contact to sharpen an oblique knife surface of a knife face of the cutting edge of each knife facing the material to be cut.

4,467,971

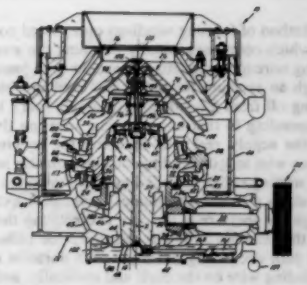
GYRATORY CONE CRUSHER

LeRoy Schuman, Milwaukee, Wis., assignor to Lippmann-Milwaukee, Inc., Milwaukee, Wis.

Division of Ser. No. 120,708, Feb. 11, 1981,. This application Oct. 9, 1981, Ser. No. 310,059

Int. Cl.³ B02C 2/04

U.S. Cl. 241—215 20 Claims



1. A gyratory cone crusher comprising

a main frame;

a bowl assembly supported by said main frame,

a spindle positioned within said main frame; and

an eccentric member having a first portion encircling said spindle and a second portion extending upwardly above said spindle;

first bearing means supporting said eccentric member on said frame for rotation relative to said spindle, said first bearing means including

a radial roller bearing assembly located between the outer periphery of said first portion of said eccentric member and said frame,

a crusher head assembly,

second bearing means supporting said crusher head assembly on said eccentric member in a position to cooperate with said bowl assembly to crush material dropped into said bowl assembly,

means for driving said eccentric member whereby a gyratory motion is produced between said crusher head assembly and said bowl assembly,

an anti-spin means connected between said spindle and said crusher head assembly, said anti-spin means including

a one-way clutch secured to said spindle and having a hexagonal socket, and

a lock means secured to said crusher head assembly, and

a brake shaft extending through the second portion of said eccentric member, and having a hexagonal ball at each end for releasedly engaging said hexagonal socket in said one-way clutch and said lock means, and

a closed circuit oil flow path through said spindle and said eccentric member for circulating lubricating oil through said first and second bearing means.

4,467,972

METHOD OF WINDING CLOSED CORES, ESPECIALLY RING CORES FOR ELECTRICAL COILS, AND DEVICE FOR PERFORMING THE METHOD

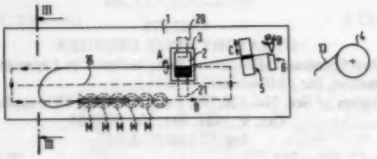
Jürgen Kaiser, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,800

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1981, 3125483

Int. Cl.³ H01F *41/08*

U.S. Cl. 242—4 R **7 Claims**



1. Method of forming windings on a closed core for electric coils which comprises initially fastening the starting end of a winding wire to a magnetizable needle; then passing the needle through an aperture formed in the core and, simultaneously, drawing off from a winding-wire supply reel a length of wire corresponding to that of a winding; severing the wire length from the supply reel and clamping the severed end of the winding-wire length; guiding the magnetizable needle fastened to the starting end of the winding wire, by action of a magnetic field, along a closed continuous travel path extending partly through the aperture in the core and rotating the core so as to wind the winding wire on the core, the closed continuous travel path decreasing in length with duration of winding of the winding wire on the core; and cyclically, and with consideration of the continuous travel path decreasing in length with duration of winding, switching on and stepping a closed chain of electro-magnets extending parallel to the continuous travel path for guiding the needle by the action of the chain of electromagnets.

2. Device for performing the method of forming windings on a closed core for electric coils, comprising a plate-shaped winding-wire support of electrically and magnetically insulating material formed with a cutout for receiving therein a core to be wound,

core rotating means operatively associated with said winding-wire support,

a winding wire supply reel disposed at a distance from said cutout together with a device for drawing off the winding wire from said supply reel along a lateral surface of said winding-wire support,

wire clamping and severing means located between said cutout and said supply reel,

a needle, means of fastening a starting end of the winding wire to said needle, a closed chain of electromagnets located on a lateral surface of said wire support opposite said first-mentioned surface thereof,

and means for cyclically switching said electromagnets on in stepwise fashion for moving a magnetic field parallel to a closed continuous travel path for said needle so as to slide said needle through an aperture formed in the core, said magnetic field being guidable along a continuous travel path having a length decreasing with duration of winding of the winding-wire on the core.

4,467,973

AUTOMATIC INSULATING TAPE WRAPPING APPARATUS

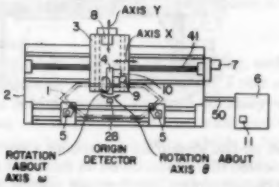
Kazutoshi Iwata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 6, 1982, Ser. No. 395,749

Claims priority, application Japan, Jul. 15, 1981, 56-110248

Int. Cl.³ B65H *81/08*

U.S. Cl. 242—7.08 **7 Claims**



1. An automatic insulating tape wrapping apparatus for wrapping an insulating tape about an electric coil dividable into a plurality of sections and including a curved portion, comprising:

a tape wrapping head including a rotating ring carrying said insulating tape;

first drive means for rotating said head about said coil;

second drive means for moving said head straight along said coil;

third drive means for swinging said head about an axis perpendicular to a straight movement of said head;

a plurality of speed detectors respectively driven by said first, second and third drive means for feeding back speed signals to said first, second and third drive means respectively, and

arithmetic operation means for driving said second drive means at predetermined speeds in respective sections and for driving said third drive means for swinging said head at a predetermined speed and for a predtermined angle.

4,467,974

BATHROOM TISSUE DISPENSER

Frank T. Crim, R.R. #1, 16441 Airstrip Dr., Barryton, Mich. 49305

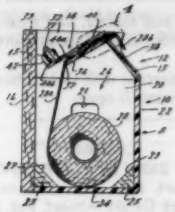
Filed Feb. 14, 1983, Ser. No. 466,113

Int. Cl.³ B65H *19/00*

U.S. Cl. 242—55.53 **6 Claims**

4. A dispenser for rolls of bathroom tissue and the like, said dispenser comprising, in combination, a housing defining a generally cubical chamber adapted to receive a roll of bathroom tissue, a cover for said housing, means pivotally connecting said cover to said housing, said cover comprising a support member and a tension member, means pivotally connecting

said tension member to said support member for combined pivotal and translatory movement relative thereto, whereby



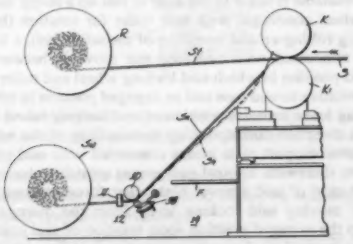
said tension member may be moved to both a loading position and a dispensing position relative to said support member.

4,467,975

SLITTER APPARATUS

Morris Friedman, Warren, Ohio, assignor to United Steel Service, Inc., Brookfield, Ohio

Filed Jun. 3, 1982, Ser. No. 384,630
Int. Cl.³ B65H 35/02
U.S. Cl. 242—564 10 Claims



7. In a slitter apparatus wherein a coil of metal to be slit is drawn from a payoff reel, the sheet metal running through laterally-spaced pairs of slitter knives for trimming portions from opposite edges of the sheet, the trimmed sheet being wound on a recoiler and the trimmed opposite edge portions being considered as scrap strips which are wound on scrap winders, the improvement comprising:

a supporting frame at the exit end of the slitter knives, said frame having horizontally-disposed guide means,

a pair of bodies slidable along said guide means, each body having spaced upright rolls, defining a pass through which a respective scrap strip passes and by which said scrap strip is guided to its scrap winder,

each body having a horizontally-disposed metal roll around which a respective scrap strip passes on its way to its winder, said horizontally-disposed roll having a hardened peripheral surface, and

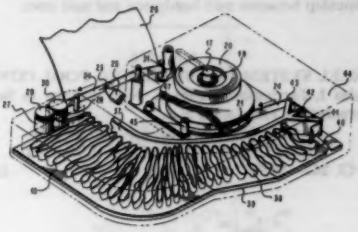
a shoe adapted to clamp a scrap strip against a respective horizontally-disposed roll to halt linear movement of said scrap strip, said shoe having a hardened clamping surface adapted to press an adjoining portion of said scrap strip against the hardened peripheral surface of said horizontally-disposed roll.

4,467,976

RIBBON CARTRIDGE COMPRISING A STUFFER BOX INTERMEDIATE A SUPPLY REEL AND TAKE-UP REEL

Francis W. Bogaczyk; Richard C. Croll; Billy D. Purcell, and Edward E. Toutant, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1982, Ser. No. 432,585
Int. Cl.³ B65H 17/02
U.S. Cl. 242—67.3 R 11 Claims



1. A ribbon cartridge comprising,

a cartridge housing,

first and second reels rotatably mounted in said housing, each supporting a portion of a ribbon web running in a path from one reel to the other, and

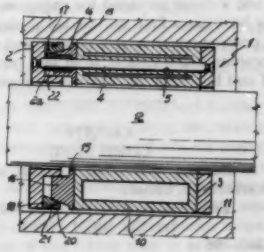
a ribbon stuffer box disposed along the path of said ribbon between said first and second reels whereby said ribbon web running between said reels passes through said stuffer box.

4,467,977

EXPANDING HEADPIECE FOR REELS IN GENERAL

Giovanni Gattrugeri, Viale Col di Lana 2, Milano, Italy

Filed Jan. 4, 1983, Ser. No. 455,620
Claims priority, application Italy, Jan. 27, 1982, 19325 A/82
Int. Cl.³ B65H 75/24
U.S. Cl. 242—72 B 9 Claims



1. An expanding headpiece for connection with a circumferential inside of a reel core in general, comprising first and second flange members in spaced apart relationship and defining an axis and a space therebetween, means for coaxially securing together said flanges, an inflatable annular chamber of elastically deformable material arranged in said space included between said flanges, said inflatable chamber having a peripheral lateral surface, base formations at opposite ends thereof and a circumferential inward surface, centering means arranged near at least one of said flanges, said centering means having at least one cooperating member having an annular surface in coaxial relationship with said axis, at least one pair of diametrically opposite engagement members slidable radially with respect to said one cooperating member of the centering means and having an engagement surface facing in use said

core of the reel and spreader means for said engagement members, wherein in inflated condition said inflatable annular chamber in use is radially expanded and is pressed with said peripheral lateral surface thereof against the inside of said core thereby to render said core rigid with said headpiece, said annular chamber in inflated condition being also axially expanded to press with at least one base formation thereof said spreader means thereby to radially shift said engagement members to cause in use said engagement members to be pressed against said inside of the core and thereby center the coaxial relationship between said headpiece and said core.

4,467,978

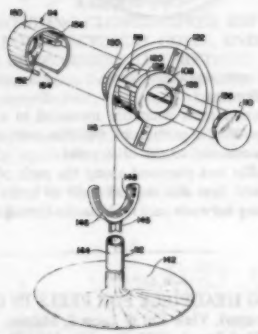
REEL SYSTEM FOR SWIMMING POOL COVERS

Douglas I. Farrington, Hohokus, N.J., assignor to Sealed Air Corporation, Fair Lawn, N.J.

Filed Oct. 27, 1982, Ser. No. 437,190

Int. Cl.³ B65H *75/02, 75/28;* E04H *3/19*

U.S. Cl. 242—86.52 **15 Claims**



1. A reel for rotating a spool comprising, a hub having means for attaching one end of said spool thereto, said hub including a portion about which said hub is rotationally supported, supporting means for rotationally supporting said hub about said portion, and a cover arranged for engagement with said hub moveable between a first and second position, said cover in said first position covering said portion, and said cover in said second position being remote from said portion to allow removal of said hub from said supporting means.

4,467,979

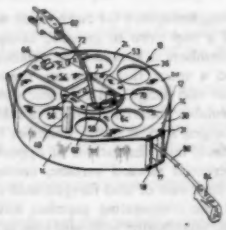
CORD REEL

Rudolph A. Koehler, Willowdale, Canada, assignor to Noma Inc., Scarborough, Canada

Filed Feb. 1, 1982, Ser. No. 344,760

Int. Cl.³ B65H *75/40*

U.S. Cl. 242—96 **19 Claims**



12. A cord reel comprising a housing, a reel mounted for rotation in said housing, said reel including a hub, said hub having a compartment housing an electrical connector terminating a cord stored on said reel;

a shutter for closing said compartment to prevent access to said connector;

means for opening said shutter, said means being operable only when said cord is substantially unwound from said reel, and

lock means interconnected with said shutter for locking said reel when said shutter is open.

4,467,980

SAFETY BELT ROLL-UP DEVICE

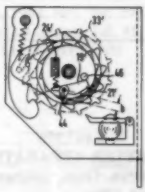
Artur Fohl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Mar. 10, 1981, Ser. No. 242,178

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011283

Int. Cl.³ A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 B **2 Claims**



1. A safety belt roll-up device for cooperating with a safety belt to restrain an occupant of a vechicle during an accident, said roll-up device comprising a base, a roller supported on the base and rotatable relative to the base to roll-up a safety belt, a locking wheel connected with said roller for rotation therewith during rolling-up and unrolling of the safety belt, a locking lever connected with said base and movable between a disengaged position in which said locking wheel and roller are rotatable relative to said base and an engaged position in which said locking lever restrains rotation of said locking wheel and roller in a direction corresponding to unrolling of the safety belt, rotatable support plate means connected with said roller for rotation therewith, control part means rotatable about the axis of rotation of said support plate, first force transmitting means for moving said locking lever from the disengaged position to the engaged position upon rotation of said control part means, control pawl means mounted on said support plate means for pivotal movement about an axis which is offset from the axis of rotation of said support plate means, stop surface means connected with said support plate means for rotation therewith, said control pawl means being pivotal between a first position in which said control pawl means engages said stop surface means and is spaced from said control part means and a second position in which said control pawl means is spaced from said stop surface means and engages said control part means to rotate said control part means with said support plate means to move said locking lever from the disengaged position to the engaged position, control disc part means rotatable with said support plate means during rotation of said roller, sensor means for retarding rotation of said control disc part means upon the occurrence of an accident, and second force transmitting means for transmitting force from said control disc part means to said control pawl means upon retardation of rotation of said control disc part means to pivot said control pawl means from the first position to the second position to thereby rotate said control part means and move said locking lever from the disengaged position to the engaged position, said second force transmitting means including means for transmitting force from said control disc part means to said control pawl means from a location on said control disc part means which is: (1) spaced from the axis about which said control pawl means pivots by a distance which is less than the

distance between a portion of said control pawl means which engages said control part means and the axis about which said control pawl means pivots and (2) disposed further from the axis of rotation of said control disc part means than the distance from the axis of rotation of said support plate means to the axis about which said control pawl means pivots.

4,467,981

WEBBING RETRACTOR

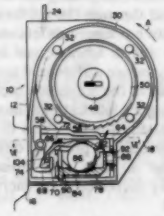
Shinji Mori, and Keiichi Tamura, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho, Aichi, Japan

Filed Jan. 5, 1983, Ser. No. 455,834

Claims priority, application Japan, Mar. 12, 1982, 57-35025[U]

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **22 Claims**



7. A webbing retractor used in a seatbelt system for protecting an occupant in an emergency situation of a vehicle, comprising:

a frame mounted to a vehicle body;

a takeup shaft journaled on said frame, for winding an occupant restraining webbing;

a lock ring disposed coaxially with said takeup shaft and stopping webbing unwinding rotation of said takeup shaft by its own stop in rotation;

a pawl engaging said lock ring, when tilted, to thereby stop said lock ring in rotation;

a bracket secured to said frame;

a support member having a plate member at its one end portion and a pin at the other end portion mounted to said bracket through said plate member and said pin, the axis of said pin being disposed on a mounting angle changing axis, said plate member being disposed perpendicularly to said axis, and said pin being inserted into a groove formed on said bracket and being fixed to the bracket under a snap action when said insertion of the pin reaches a predetermined amount;

a movable body held in said support member and moved when subjected to an acceleration;

a lever tilted when said movable body is moved; and

a transmitting means provided between said lever and said pawl and transmitting a tilting force of said lever to said pawl as a tilting force to engage said pawl with said lock ring, and to move said lever and said pawl relative to each other, when an angle, at which said support member is mounted to said frame, is changed, while transmitting the tilting force of said lever to said pawl.

4,467,982

WEBBING WINDING FORCE RESTRAINING DEVICE

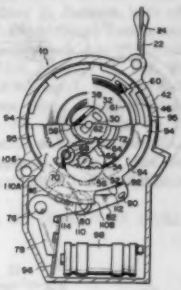
Hiromi Tajima, Toyohashi, and Akinori Fujiwara, Nagoya, both of Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho, Aichi, Japan

Filed Apr. 29, 1982, Ser. No. 373,298

Claims priority, application Japan, May 7, 1981, 56-68686; Oct. 5, 1981, 56-147852[U]

Int. Cl.³ B65H *75/48*; A62B *35/00*

U.S. Cl. 242—107.6 **12 Claims**



1. A webbing winding force restraining device used in an occupant restraining seatbelt system in an emergency situation of a vehicle for obviating a sense of oppression given to an occupant, comprising:

(a) a takeup frame secured to a vehicle body;

(b) a takeup shaft journalled on said takeup frame for winding said occupant restraining webbing;

(c) a main resilient member for giving said takeup shaft a winding biasing force against said takeup frame;

(d) a lock ring rotatable relative to said takeup shaft;

(e) an auxiliary resilient member acting between said takeup shaft and said lock ring to rotatably bias said takeup shaft in the direction of winding the webbing;

(f) memory means for restricting the rotation of the takeup shaft relative to the lock ring in the direction of winding the webbing at a predetermined position;

(g) a holding mechanism on said frame which is approachable to and separatable from said lock ring for restricting the rotation of said lock ring relative to said frame when engaged with said lock ring; and

(h) a control plate interposed between said holding mechanism and said lock ring and receiving the rotation of said takeup shaft through a frictional force, for engaging said holding mechanism with said lock ring when the webbing is withdrawn after the webbing has been fastened about the occupant, whereby when said holding mechanism engages said lock ring, said memory means is operated to restrict rotation of said takeup shaft so as not to allow the biasing force of said main and auxiliary resilient members to act on the occupant so that the sense of oppression given to the occupant can be obviated.

4,467,983

UNREELING DEVICE AND TAPE READER INCORPORATING SUCH AN UNREELING DEVICE

Michel Ledun, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Aug. 31, 1982, Ser. No. 413,510

Claims priority, application France, Sep. 11, 1981, 81 17234

Int. Cl.³ G03B *1/04, 1/56*; G11B *15/32*

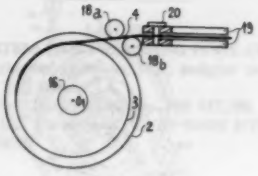
U.S. Cl. 242—195 **9 Claims**

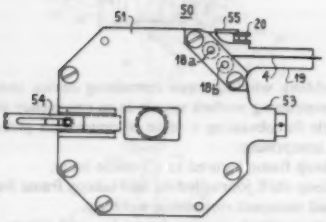
1. A tape unreeling device comprising:

a feed reel on which is wound a tape provided with a leader;

a take-up reel for receiving said tape, wherein the take-up reel includes a strap for pulling the tape;

coupling means provided for placing the free end of said strap adjacent said leader of the tape and for joining said strap and said leader together during coupling and for disengaging said strap and said leader during uncoupling, said strap and said leader being provided with mutual coupling elements, wherein the coupling means comprise a set of buttons on said leader and a set of corresponding





buttonholes on said strap, wherein said mechanical device comprises an element for positioning and guiding said leader of the tape and, facing said positioning element, a moving plate for causing the said buttons to be plugged into the set of buttonholes positioned on the end of the free portion of the driving strap, and wherein the positioning element includes retractable positioning supports for transversely engaging in perforations located on said leader of the tape.

4,467,984

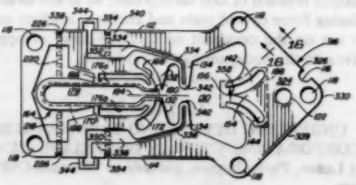
ANGULAR RATE SENSING APPARATUS AND METHODS

Thomas B. Tippetts, Mesa, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 12, 1980, Ser. No. 206,195

Int. Cl.[3] **B64C** *13/16;* **F15C** *1/06, 1/04, 3/00*

U.S. Cl. 244—78 **80 Claims**



30. Angular rate sensing apparatus comprising:

(a) a fluidic angular rate sensor having jet-forming means for receiving fluid from a source thereof and discharging a fluid jet, and jet-receiving means spaced from said jet-forming means for utilizing said jet to create a pair of fluidic output signals having a relative pressure differential indicative of the rate and sense of rotation of said rate sensor about a control axis;

(b) means for supplying fluid to said jet-forming means; and

(c) jet-control means operatively associated with said fluid-supplying means for maintaining the Reynolds number of said jet within a predetermined range to thereby environmentally stabilize the operation of said rate sensor,

said jet-control means including means for sensing the temperature of said jet, means for sensing the pressure of said jet, and means for varying the velocity of said jet in response to the sensed temperature and pressure thereof.

38. Apparatus for use in preventing environmentally caused jet drift in a device, such as a fluidic rate sensor or the like, adapted to receive fluid and form a fluid jet therefrom, said apparatus comprising:

(a) means for sensing the temperature and pressure of the jet; and

(b) means for varying the velocity of the jet in response to the sensed pressure and temperature to thereby maintain the Reynolds number of the jet within a predetermined range.

49. A method of calibrating a fluidic angular rate sensor having: jet-forming passage means for receiving fluid, flowing the fluid along a flow axis, and discharging the fluid in the form of a jet having a jet axis; splitter means spaced from the passage means and positioned in the path of the jet for dividing it into two separate streams; and a pair of receiving passages each adapted to receive one of the streams and be pressurized thereby, said method comprising the steps of:

(a) flowing fluid through the jet-forming passage means to thereby create a pressure differential between the receiving passages due to fabricational inaccuracies in the rate sensor, said pressure differential monotonically increasing with increases in the Reynolds number of the jet;

(b) compensating for fabricational misalignment between the splitter means and the flow axis to thereby alter the relationship between said pressure differential and said Reynolds number so that said pressure differential non-monotonically increases upon increases in said Reynolds number; and

(c) precisely aligning the jet axis with the flow axis to thereby substantially eliminate said pressure differential within a range of Reynolds numbers of the jet.

56. The method of constructing a fluidic angular rate sensor comprising the steps of:

(a) providing a main rate sensor lamina;

(b) forming in said main rate sensor lamina openings defining an interaction channel, a nozzle portion having a passage extending therethrough and opening forwardly into said interaction channel, said passage having a flow axis, means connecting said nozzle portion to an adjacent portion of said main rate sensor lamina in a manner permitting movement of said nozzle portion relative to said adjacent rate sensor lamina portion, a splitter portion spaced forwardly of said passage and having a rearwardly facing leading section generally aligned with said flow axis, and a pair of receiving channels opening rearwardly into said interaction channel and positioned on opposite sides of said splitter portion;

(c) providing a plurality of auxiliary laminae;

(d) stacking said main rate sensor lamina and said auxiliary laminae so that said main rate sensor lamina is positioned between a pair of said auxiliary laminae;

(e) intersecuring the stacked laminae to form a laminated body, said intersecuring being performed in a manner permitting movement of said nozzle portion within said body; and

(f) providing means associated with said body for adjustably moving said nozzle portion within said body to thereby compensate for fabricational inaccuracies in said nozzle portion.

75. A fluidic angular rate sensor constructed by a method comprising the steps of:

(a) providing a main rate sensor lamina;

(b) forming openings through said main rate sensor lamina to define therein:

(1) an interaction channel,

(2) a nozzle portion having a rear section and a pair of opposite wall members positioned forwardly of said rear section on opposite sides of a nozzle passage opening forwardly into said interaction channel and having a flow axis, and

(3) support sections connecting said nozzle portion to the remainder of said main rate sensor lamina in a manner permitting movement of said rear nozzle portion relative to said remainder and causing, in response to said movement, a relative movement between said opposite wall members in a direction generally parallel to said flow axis;

(c) providing first and second pluralities of auxiliary laminae;

(d) stacking said main and auxiliary laminae so that said main lamina is positioned between first and second pluralities of auxiliary laminae;

(e) intersecuring the stacked laminae to form a laminated rate sensor body, said intersecuring being performed in a manner permitting said movements of said rear nozzle portion section and said opposite wall members relative to said rate sensor body; and

(f) providing means associated with said rate sensor body for exerting a selectively variable force upon said rear nozzle portion section to thereby cause a selectively variable degree of relative movement between said opposite wall members of said nozzle portion.

4,467,985

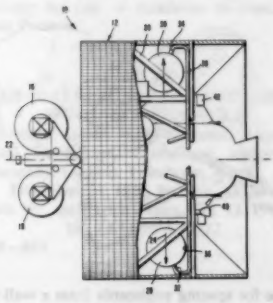
VORTEX INHIBITING CLOSED SPHERICAL OUTLET STRUCTURE

Jeremiah O. Salvatore, Redondo Beach, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 200,678, Oct. 27, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,467

Int. Cl.³ B64G *1/66*

U.S. Cl. 244—135 R **4 Claims**



1. A closed spherical tank for mounting in a spin-stabilized spacecraft for the storage and discharge of propellant liquid in a space environment having a gravity vector due to the spinning of the spacecraft, said tank comprising:

a closed spherical tank shell having a center point and enclosing an unobstructed spherical tank interior volume for the containment of propellant liquid, said tank having an axis through the center of said tank and in line with the local gravity vector caused by the spinning of the spacecraft, the improvement comprising:

said closed spherical tank of unobstructed interior having an outlet comprising an opening in said closed spherical shell and an outlet tube connected to said opening and extending out of said opening and not into said shell to provide a completely open unobstructed interior in said shell, said outlet tube being for discharging propellant liquid from said closed spherical shell of said tank;

said outlet being between 1° and 15° angularly away from said spherical tank center line axis in line with the local gravity vector caused by spinning of the spacecraft to inhibit vortexing in propellant liquid being discharged from said spherical tank out of said outlet.

4,467,986

RESERVE PARACHUTES

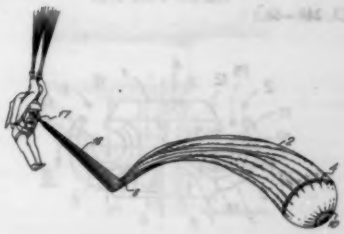
Stanley A. Birch; Sidney B. Jackson, both of c/o Irvin Great Britain Limited, Icknield Way, Letchworth, Hertfordshire, England; Eric J. F. Edmonds, c/o PQ Division N.A.M.M.A. Arabella Strasse 16,8, Munich 36, Fed. Rep. of Germany; Robert V. Gigg, and Norman L. Haggert, both of c/o ADAES, A & AEE, Boscombe Down, Wilshire, England

Continuation of Ser. No. 043,566, May 29, 1979, abandoned, which is a continuation of Ser. No. 860,417, Dec. 13, 1977, abandoned. This application Sep. 2, 1981, Ser. No. 298,690

Claims priority, application United Kingdom, Dec. 15, 1976, 52361/76

Int. Cl.³ B64D *17/38, 17/62*

U.S. Cl. 244—147 **12 Claims**



1. In a reserve parachute for deployment at low speeds of descent and including a reserve parachute pack, a main reserve canopy, and rigging lines attached to said canopy, said canopy and rigging lines being packed within said reserve parachute pack for deployment therefrom; said main reserve canopy including an apex, an apex area, a skirt defining a canopy mouth, and expander means for expanding a portion of said canopy; and restraint means attached to said reserve parachute pack and to a selected point along said rigging lines for allowing only a given length of rigging lines to said selected point to be deployed initially, said expander means providing an induced initial canopy deployment at said low speeds of descent having a drag profile with a greater drag action on said apex area of said canopy than that acting on said skirt, said restraint means operatively interacting with said expander means to facilitate said induced initial canopy deployment and said expander means enabling use of said restraint means in a reserve parachute, and said restraint means being operative after said induced initial canopy deployment to release the remainder of said rigging lines for full parachute deployment.

4,467,987

QUARTER TURN FASTENER

Edith M. Small, New Lenox, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

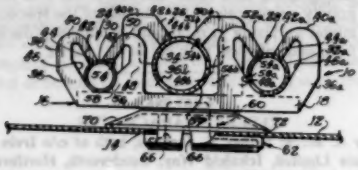
Filed Feb. 4, 1982, Ser. No. 345,947

Int. Cl.³ E04G *5/06*

U.S. Cl. 248—68.1 **7 Claims**

1. The combination of a rotatably blade installable integral fastener for support of at least one fluid line retaining means thereon and an aperture formed in a panel, said fastener including a restricted neck adjoining a body means and adapted to extend through said aperture, an enlargement on said neck engaging the remote side of said panel to hold said fastener in the installed position on said panel, said neck and said aperture

being shaped to permit limited rotatable movement of said fastener during installation to position said retaining means in a



predetermined manner, and panel engaging means for accommodating panels of different thicknesses comprising cam surfaces, said fastener being constructed of resilient material.

4,467,988

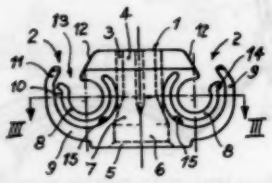
PIPE FASTENER

Willibald Kraus, Kaiserslautern, Fed. Rep. of Germany, assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 8, 1982, Ser. No. 346,449

Int. Cl.³ F16L 3/22

U.S. Cl. 248—68.1 **5 Claims**



1. A retaining element for at least one elongate article comprising a mounting section adapted to be attached to a support and at least one retaining section for partially enclosing the circumference of the elongate article wherein the retaining section comprises an inner clamp which is adapted in use to enclose the circumference of the elongate article and an outer clamp which is spaced from and surrounds the inner clamp, and wherein the outer clamp has a lip which overlaps the adjacent inner clamp and with an outer face of the mounting section forms a press-in entry area for the insertion of the elongate article into the inner clamp.

4,467,989

COLLAPSIBLE RACK FOR PLASTIC BAG

Alvin L. Stroh, Downey, Calif., assignor to McMillin Wire & Plating, Inc., Los Angeles, Calif.

Filed Sep. 24, 1982, Ser. No. 423,217

Int. Cl.³ B65B 67/00

U.S. Cl. 248—97 **8 Claims**

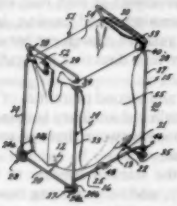
1. A rack for a plastic bag comprising:

a rectangular base formed of wire to include transverse portions and longitudinal portions and a notch at each of its corners, each said notch formed of a pair of vertically spaced U-shaped wire portions with one of the U-shaped wire portions being formed as a continuation of the transverse portion and the other wire portion being formed as a continuation of the longitudinal portion of the base;

a pair of side supports, each side support formed of wire to include a pair of spaced elongated arms with holder portions joining the upper ends thereof and with hooks on the lower ends thereof by which each side support is held on a transverse portion of said base;

each side support capable of being swung on the respective transverse portion of said base to a position substantially in the plane of the base when said base is positioned with the U-shaped wire portion forming continuations of the transverse portions located above the U-shaped wire portions forming continuations of the longitudinal portions; and

each side support capable of having its elongated arms effectively locked in a substantially upright position by the U-shaped wire portions forming continuations of the longitudinal portions when said base is positioned with the U-shaped wire portions forming continuations of said



transverse portions located below the U-shaped wire forming continuations of the longitudinal portions of the base;

whereby when said side supports have their elongated arms effectively locked in a substantially upright position a plastic bag having arm holes on each upper side thereof can be suspended with its arm holes on the holder portions of said side supports and the mouth of the bag in an open position.

4,467,990

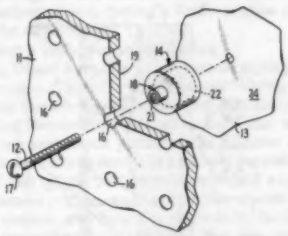
PEGBOARD SPACER

Robert F. Wiseman, 2800 Arguello Dr., Burlingame, Calif. 94010

Filed Sep. 21, 1981, Ser. No. 303,907

Int. Cl.³ E04G 3/00

U.S. Cl. 248—220.3 **4 Claims**



1. A device for spacing pegboards from a wall or the like, comprising

a member having a thickness equivalent to the desired spacing of the PEGBOARD from the wall and formed for providing an opening through said member sized to accomodate the shank of a mounting element chosen from the class of screws, nails and bolts,

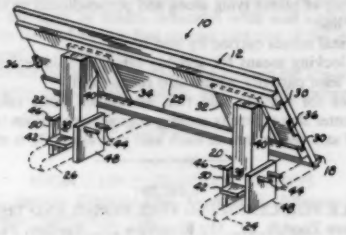
and means on said member formed for releasably securing said member to the rear side of the PEGBOARD prior to installation of said PEGBOARD with said opening in alignment with a perforation in said PEGBOARD through which said mounting element passes, said means comprising a collar extending from said member in coaxial alignment with said opening and formed for press fit engagement in a perforation in said PEGBOARD for releasably securing said member to the rear side of said PEGBOARD.

4,467,991

ARMCHAIR READING STAND

Robert B. Bailes, 501 Mimosa Dr., Stigler, Okla. 74462

Filed Jan. 11, 1982, Ser. No. 338,803
Int. Cl.³ A47B 19/00
U.S. Cl. 248—447.1 3 Claims



1. A book and paper supporting stand for an armchair, or the like, comprising:

an elongated panel adapted to extend transversely across the arms of an armchair, or the like, in a forward and upwardly inclined plane defining an upper and a lower panel surface;

a pair of standards depending from and supporting said panel above chair arms when disposed thereon;

tongue and groove means slidably connecting said standard with said panel,

said tongue and groove means including a pair of rails secured to the lower panel surface adjacent its respective longitudinal upper and lower edges,

each said rail having a longitudinal rabbeted edge disposed in confronting relation with the rabbeted edge of the opposite rail, and,

a sliding plate secured to the upper end portion of the respective standard and having opposing edge portions slidably received by the respective rail rabbeted edge; and,

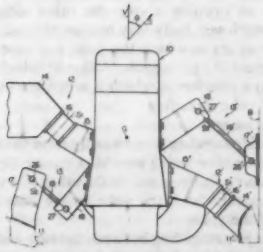
grip plate means connected with the respective standard for maintaining the pair of standards on chair arms when disposed thereon.

4,467,992

POWER-UNIT MOUNTING STRUCTURE FOR AUTOMOTIVE VEHICLE

Hiroaki Morimura, Atsugi; Hideki Minami, Tokyo, and Shunichiro Kanai, Sagamihara, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 24, 1982, Ser. No. 423,284
Claims priority, application Japan, Oct. 12, 1981, 56-162359
Int. Cl.³ F16M 11/12
U.S. Cl. 248—659 15 Claims



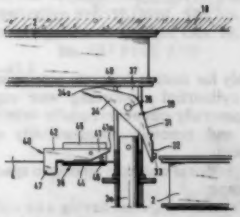
1. A power-unit mounting structure for mounting on the body structure of an automotive vehicle a power unit having a rotatable output shaft extending in a lateral direction of the body structure, comprising a plurality of shock and vibration dampening units each comprising a resilient insulator block which is structurally adapted to be securely connected between the body structure of the vehicle and the body structure of the power unit, wherein said shock and vibration dampening units include a pair of shock and vibration dampening units the respective insulator blocks of said pair being disposed in such a manner as to produce shear stresses in directions which are substantially parallel with each other and which are adapted to be inclined with respect to the body structure of the vehicle at a predetermined angle to vertical and horizontal planes.

4,467,993

FORM SYSTEM FOR CEILING FORMWORKS

Wolfgang Markewitz, Hilden, and Heinz Schwechheimer, Jülich, both of Fed. Rep. of Germany, assignors to Hunnebeck GmbH, Fed. Rep. of Germany

Filed Nov. 19, 1981, Ser. No. 322,977
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046284
Int. Cl.³ E04G 11/36
U.S. Cl. 249—28 9 Claims



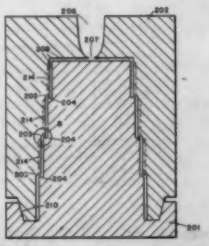
1. A form system wherein the said catch is in the form of a locking latch which is adjustable against a force applied by a weight or a spring.

4,467,994

CORE CENTERED MOLD FOR HOLLOW STACKABLE PLASTIC PRODUCTS

Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Filed Sep. 27, 1982, Ser. No. 424,493
Int. Cl.³ B29C 1/14; B29F 1/022
U.S. Cl. 249—144 8 Claims



1. A mold for injection molding of thin-walled, hollow, stackable plastic products, comprising a core part and a cavity part, where the relative reciprocal wall thickness of the molded product may be equalized by centering the core part in the cavity part during injection; the core part and the cavity part each having an axially extending circumferential recess in a circumferential shoulder, each said recess limiting an axially

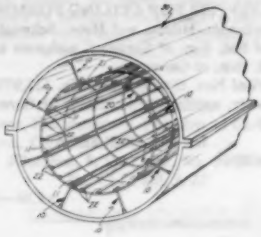
extending annular projection, corresponding such projections located on the sides of the core part and the cavity part respectively in combination defining a core-centering circumferential throttle.

4,467,995

SPACER BAR AND RELATED METHOD FOR CONCRETE PIPE MANUFACTURE

Wilbur E. Tolliver, 364 Hamilton Dr., Holland, Mich. 49423

Division of Ser. No. 56,602, Jul. 11, 1979, Pat. No. 4,295,501.
This application Jul. 30, 1981, Ser. No. 288,309
Int. Cl.³ F16L 55/00
U.S. Cl. 249—160 3 Claims



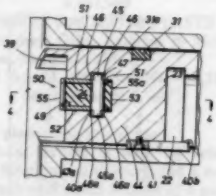
1. An assembly for casting concrete pipe comprising:
a generally cylindrical reinforcing wire cage, said cage including generally circumferentially oriented wire reinforcement and generally longitudinally oriented wire reinforcement;
a generally cylindrical concrete pipe form spaced outwardly from said cage;
a plurality of spacer bars, each having a tie rod and a plurality of links joined to and spaced along the length of said tie rod generally parallel to one another;
said spacer bars being secured to said cage at spaced points around the entire circumference thereof with said links projecting generally radially therefrom and contacting the inside surface of said form to hold said cage in properly spaced relationship with respect to said pipe form.

4,467,996

VALVE APPARATUS

Benton F. Baugh, P.O. Box 42888 Dept 195, Houston, Tex. 77042

Filed Jul. 6, 1982, Ser. No. 395,616
Int. Cl.³ E21B 33/06
U.S. Cl. 251—1 A 22 Claims



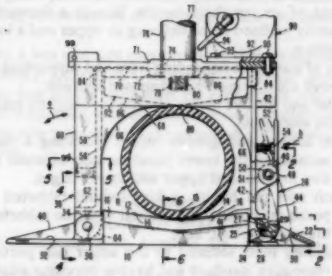
1. A valve assembly for regulating fluid flow, comprising:
a housing having a bore disposed in the direction of a vertical bore center line and further having two cavities intersecting said bore laterally from opposite sides of said bore along a cavity center line perpendicular to said bore center line;
a pair of ram assemblies each slidably disposed in one of said cavities and including
a ram body having a wall disposed about said cavity center line and a recess in one end thereof proximal to said bore extending internally through said body to opposite sides of said wall about and along a third line perpendicular to said bore center line and said cavity center line, said recess having a plurality of first cross-sections of a substantially uniform cross-shape, each of said cross-sections being formed by intersection with said recess of a corresponding different one of a plurality of planes lying along and perpendicular to said third line;
a seal means carried by said body;
a locking means for slidably retaining said seal means at least partially within said recess; and
means for moving said ram assemblies along said cavity center line whereby sealing engagement within said bore of said seal means of each said ram assembly is effected.

4,467,997

DEVICE FOR CLAMPING FIRE HOSES AND THE LIKE

Theodore Ziaylek, Jr., 140 Riverview Dr., Yardley, Pa. 19067

Filed Sep. 10, 1982, Ser. No. 416,440
Int. Cl.³ F16L 55/14
U.S. Cl. 251—7 5 Claims



1. A device for clamping an elongated, tubular flexible body such as a fire hose, comprising:
(a) a base formed with a stationary, upwardly facing lower jaw having, in the sense of the transverse dimension of a tubular, flexible body to be clamped, a shallowly V-shaped concavity defined by oppositely sloped, flat crest surfaces defining between them a wide, upwardly opening obtuse angle, and meeting at a central low point to receive and center between them the body to be clamped, said jaw, in the sense of the longitudinal dimension of said body, having flat, shallowly sloped, flat surfaces defining a wide, downwardly opening obtuse angle the apex of which coincides with said central low point;
(b) a yoke of inverted U-shape having a hinge connection to one side of the base about which the yoke is swingable about an axis paralleling the length of said body between a position providing an opening above the other side of the base through which said body may be inserted and removed, and a closed position in which the yoke and base cooperate to define a generally rectangular frame in which said body is confined in a position in which it is centered upon said low point, said yoke including
(1) a top plate and
(2) side walls extending downwardly from the top plate, said hinge connection being provided on one of said walls;
(c) latch means on the base and on the other side wall cooperating to releasably latch the yoke to the base in the closed position of the yoke;
(d) a movable jaw extending between the side walls of the yoke and slidably mounted thereon for movement toward and away from the stationary jaw, said movable jaw having in the sense of the transverse dimension of said body a pair of flat, downwardly facing clamping surfaces defining between

them an upwardly opening obtuse angle, said clamping surfaces of the movable jaw being downwardly shallowly convergent to meet at a central apex portion vertically aligned with the low point defined between the first-named surfaces of the stationary jaw, said movable jaw additionally having a pair of flat side surfaces that in the sense of the longitudinal dimension of the body to be clamped, are downwardly, shallowly convergent at an obtuse angle to each other the apex of which coincides with said central apex portion defined by the first named surfaces of the movable jaw; and

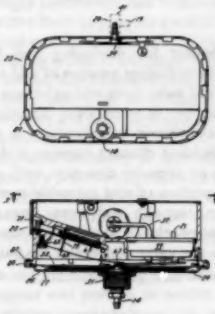
(e) means for shifting the movable jaw toward the lower jaw to clampably engage said tubular, flexible body between the jaws.

4,467,998

HIGH GAIN PNEUMATIC SWITCH

Scott L. Spence, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Jul. 11, 1983, Ser. No. 512,445
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—58 **13 Claims**



1. An amplifying pneumatic switch responsive to low pressure signals and including:

a first chamber for receiving an input signal from a first pneumatic pressure source at a first pressure, said first chamber including a member formed by a continuously formed, highly resilient diaphragm molded of a homogeneous material;

a single diaphragm plate disposed exteriorly of said first chamber and generally coextensive with and responsive to the movement of said diaphragm;

a jet adapted to be coupled to a second pneumatic pressure source and sealable for generating a pneumatic output signal at a second pressure;

means for sealing said jet in response to said input signal, said sealing means including lever means and plunger means coactively responsive to movement of said diaphragm for jet sealing;

said lever means including a force amplifying lever pivotably supported at a first end, coacting with said diaphragm plate at a second end and coacting with said plunger means at a point generally midway between said first end and said second end, and;

spring means for biasing said diaphragm plate to a quiescent position in the absence of said input signal.

7. A high gain, pneumatic modulating switch responsive to very low pressure signals, said switch including:

a rigid first wall member;

a highly resilient, continuously formed sensing diaphragm molded of a homogeneous material and cooperating with said first wall member to define a sensing chamber for detecting a pneumatic input pressure modulating within a first range of pressure;

a single diaphragm plate disposed exteriorly of said sensing chamber to be generally coextensive with and responsive to the movement of said sensing diaphragm;

spring means for biasing said plate to a quiescent position in the absence of said input pressure;

a rigid housing member;

a highly resilient, convoluted control diaphragm cooperating with said housing member to define a control chamber, said control chamber being pneumatically isolated from said sensing chamber;

a control jet disposed in said control chamber and adapted to be controllably modulated by said control diaphragm for generating a pneumatic output pressure modulating within a second range of pressure, and;

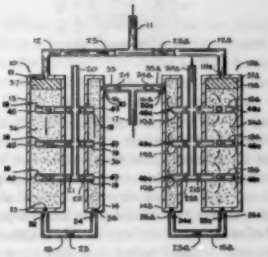
a modulating assembly coacting between said plate and said control diaphragm for controllably modulating said output pressure in response to modulations in said input pressure.

4,467,999

DIAPHRAGM VALVE FOR MULTIPLE VESSEL CASCADE GAS ENRICHMENT SYSTEM

Robert A. Ritter, 5108 Varsciiff Rd. NW., Calgary, Alberta, Canada

Division of Ser. No. 107,860, Dec. 28, 1979, Pat. No. 4,321,069.
This application Feb. 19, 1982, Ser. No. 350,413
Claims priority, application Canada, Oct. 26, 1979, 338533
Int. Cl.³ F16K *9/00*
U.S. Cl. 251—61.1 **4 Claims**



1. In combination, a diaphragm valve and a hollow, gas-conducting tube to control the flow of gas therethrough comprising:

(1) a capped hollow core connected at only one area to said hollow, gas-conducting tube, said capped, hollow core being provided with at least one perforation through the wall thereof and with a pair of longitudinally spaced-apart annular protrusions, one on each longitudinal side of said at least one perforation;

(2) a molded cylindrical tubular elastomeric diaphragm secured concentrically to said hollow core at said annular protrusions which comprise a pair of spaced-apart locations on either side of said at least one perforation, said diaphragm having walls adjacent the secured ends thereof which are thicker internally than the walls at the region of said at least one perforation so as to maintain the outer cylindrical tubular shape of said diaphragm, said thicker internal walls each being provided with a pair of longitudinally spaced-apart abutments, said diaphragm thereby providing an annular flow path for gas between the outside walls of said diaphragm and the inner walls of said hollow, gas-conducting tube to permit the flow of gas therethrough;

(3) an annular encircling band surrounding said diaphragm at said annular protrusions, with each pair of longitudinally spaced-apart abutments being disposed on either side of an associated protrusion, said band being radially

spaced from the inner walls of said gas-conducting tube, whereby to urge said diaphragm against said protrusions; and

(4) means for applying gaseous pressure to the interior of said capped hollow core;

thereby

(5) to expand said diaphragm radially outwardly so that its outside walls are in sealing engagement with the inner walls of said hollow gas conducting tube to stop the flow of gas therethrough.

4,468,000

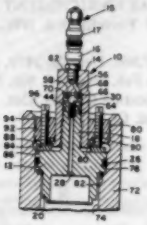
CONTROL ROD DRIVE MECHANISM VENT VALVE ASSEMBLY

Robert C. Smith, Bremen, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 87,896, Oct. 24, 1979,. This application Jul. 29, 1981, Ser. No. 288,243

Int. Cl.³ F16K *1/14*

U.S. Cl. 251—84 **8 Claims**



1. A vent valve for periodically venting fluid from a control rod drive device of a nuclear reactor comprising a first valve seat within said device, said first valve seat having a conical seating surface formed therein and an orifice passing through said valve seat and intersecting said conical seating surface, a second valve seat within said device located proximately to an inner wall of said device and oppositely disposed from said first valve seat, said second valve seat having a conical seating surface formed therein, a ball interposed between said first valve seat and said second valve seat, spring means for biasing said ball away from said conical seating surface in said first valve seat to allow longitudinal movement of said first valve seat relative to said second valve seat to provide selective engagement and disengagement of said ball with said first valve seat causing the closing and opening of said orifice regulating the flow of fluid therethrough, a horizontal wall surface in said vent valve spaced from said second valve seat surface, said second valve seat being free floating with respect to the inner walls of said vent valve to allow said second valve seat to be movable along said horizontal wall surface of said vent valve to align itself with respect to said first valve seat causing said ball to be self-centering with respect to said first valve seat when said first and second valve seats are moved longitudinally with respect to each other to engage and disengage said ball with said first valve seat.

4,468,001

SHUT OFF VALVE FOR FLUIDS

Miodrag Stanic, G. G. Deza 43/13, Novi Beograd, Yugoslavia

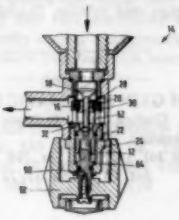
Filed Aug. 31, 1982, Ser. No. 413,398

Claims priority, application Yugoslavia, Sep. 3, 1981, 2120/81

Int. Cl.³ F16K *25/00, 31/50*

U.S. Cl. 251—86 **9 Claims**

1. A shut-off valve for fluids, preferably for sanitation taps, which includes a valve housing, a valve piston which is displaceable in said valve housing, an operating element such as a hand wheel, a valve seat disposed in said housing, said valve piston having a valve head which can be lowered with said valve piston to engage the valve seat and raised in the direction of flow to move away from said valve seat, the improvement comprising said holding element having means engaging said valve piston so that said valve piston is movable relative to said holding element, said holding element being displaceable in a cylinder-shaped guide element to achieve axial movement with respect to said guide element, said guide element having a lower edge and having an upper edge co-operating with a further element containing said valve seat, said guide element including a freely rotatable member having an end engaging



said holding element for displacing said holding element towards said valve seat upon rotation of said rotatable member in one direction and away from said valve seat upon rotation of said rotatable member in an opposite direction, said rotatable member being rotatable in one direction in said holding element until said holding element engages said further element and rotatable in an opposite direction until said holding element engages a portion of said rotatable member whereupon said valve piston, through said means engaging enables the valve piston to move relative to said valve seat so as to prevent damage between the valve piston and the valve seat.

4,468,002

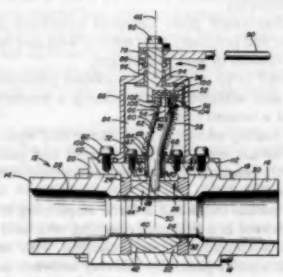
ACTUATOR MECHANISM FOR DOUBLE BENT BELLOWS SEALED ROTARY VALVE

Richard P. Tremblay, Pittsburgh, Pa., assignor to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Mar. 11, 1982, Ser. No. 357,284

Int. Cl.³ F16K *41/10*

U.S. Cl. 251—335 B **11 Claims**



1. A valve comprising,

a valve body,

a passageway extending through said valve body for the flow of fluid therethrough,

a valve member positioned in said passageway for movement between an open position and a closed position to open and close said passageway, said valve member having an axis,

actuating means rotatable about an axis coaxially aligned

with said valve member axis for moving said valve member between an open position and a closed position,

a unitary valve stem extending between said valve member and said actuating means,

said unitary valve stem having a lower end portion in nonrotatable engagement with said valve member and an upper end portion connected to said actuating means for transmission of rotation from said actuating means to said valve member,

said valve stem lower end portion having a lower axis aligned withsaid valve member axis and said actuating means axis,

said valve stem upper epd portion axis being laterally displaced from and positioned parallel to said actuating means axis and said valve stem lower end portion axis to provide said valve stem with a bent configuration,

said valve stem upper end portion being orbited about said valve member axis as said actuating means is rotated to move said valve member between said open and closed positions,

a bellows surrounding said unitary valve stem, said bellows having a lower end portion and an upper end portion,

means for sealingly connecting said bellows lower end portion to said valve body to provide a seal around said valve stem lower end portion at said valve body,

said valve stem being sealed at said upper end portion within said bellows so that said bellows forms a primary pressure boundary around said stem to contain internal pressure within said bellows and prevent leakage of fluid and pressure through said bellows,

said primary pressure boundary at said bellows upper end portion including a bellows cap received within said actuating means, said bellows cap positioned in spaced relation around said valve stem upper end portion,

said bellows upper end portion being sealingly connected to said bellows cap,

first bearing means for supporting said bellows cap on said valve stem upper end portion to permit rotation of said valve stem relative to said bellows cap, and

second bearing means retained in said actuating means for supporting said actuating means on said bellows cap to permit rotation of said actuating means relative to said bellows cap and transmit rotation from outside said primary pressure boundary through said second bearing means, said bellows cap, and said first bearing means to said valve stem in said primary pressure boundary.

4,468,003

PROCESS FOR PULLING CABLES INTO CONDUITS

Bernard Nonclercq, Trouery; Pierre Le Cabec, Bourg-Pommerit-Jaudy, both of 22450 La Roche-Derrien, and Francois Le Damany, Louannec, 22700 Perros Guirec, all of France

Filed Mar. 8, 1982, Ser. No. 355,604

Claims priority, application France, Mar. 10, 1981, 81 04780

Int. Cl.³ B65H *59/00*

U.S. Cl. 254—134.3 FT **6 Claims**

1. A method of locating a cable in a tubular conduit, including the steps of: forming a layer of balls having diameters substantially lower than the cable diameter and adhering to the inner surface of said tubular conduit, throughout the surface of the conduit by blowing an air flow in which said balls are in suspension along said conduit under conditions selected to distribute said balls throughout the length of said conduit; and pulling the cable along said conduit on said layer.

4,468,004

PORTABLE LIFTING DEVICE

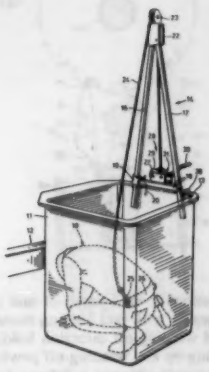
Brian W. Shaver, 6 Lyndfield Crescent, Brampton, Ontario, Canada L6W 2P5, and Patrick J. Palangio, 41 Forest Park Rd., Orangeville, Ontario, Canada L9W 1A1

Filed Dec. 27, 1982, Ser. No. 453,272

Claims priority, application Canada, Nov. 1, 1982, 414591

Int. Cl.³ B66D *3/02*

U.S. Cl. 254—325 **5 Claims**



1. A portable lifting device designed for the removal of an injured person from a boom supported aerial bucket having a peripheral flange, the device comprising a davit having a footing adjacent one end thereof, the footing being engageable with the bucket flange for supporting the davit in an operative position, a pulley mounted at the other end of the davit, and a winch unit mounted on the davit, the winch unit having a cable extending over the pulley, the cable providing at its free end means for securing engagement with an injured person to be removed from the bucket, wherein the davit comprises a collapsible A-frame with two leg members pivotally connected together at said other end of the davit and a transverse bar pivotally connected to one of the leg members, the other leg member carrying a mounting bracket connected to the free end of the transverse bar, the mounting bracket being slidable along said other leg member between first and second limit positions whereby the leg members can be folded together for stowage of the device.

4,468,005

LEVER HOIST

Takayoshi Nakamura, Atsugi, Japan, assignor to Kabushiki Kaisha Kito, Kawasaki, Japan

Filed Feb. 25, 1983, Ser. No. 469,653

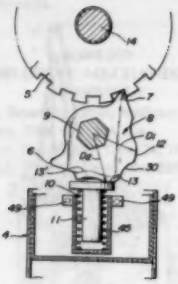
Claims priority, application Japan, Mar. 1, 1982, 57-27162[U]

Int. Cl.³ B66F *19/00, 3/30;* G05G *1/12;* F16D *13/42*

U.S. Cl. 254—350 **1 Claim**

1. A lever hoist including a change gear provided on a driving member for driving a sheave about which is wound up a chain, rope or the like for a load, an operating lever rockable about said driving member by a hand, a winding-up driving pawl engageable with teeth of said change gear and driven by said operating lever in a winding-up direction for the load, a winding-off driving pawl engageable with the teeth of said change gear and driven by said operating lever in a winding-off direction for the load, and a braking assembly preventing said change gear from being driven from a side of said sheave and having an elastic resistance member directly or indirectly engaging said driving member for releasing said braking assembly, said lever hoist comprising urging means for urging said winding-up and winding-off driving pawls against said teeth of said change gear in a manner such that said winding-off driving

pawl is urged against said teeth with a larger force than that of said winding-up driving pawl urged against said teeth, said urging means comprising an urging spring housed in said operating lever and a holding member urged by said urging spring so as to urge said winding-up and winding-off driving pawls against said teeth of said change gear, said winding-up and winding-off driving pawls being formed in a unitary member pivotally secured to said operating lever by means of a pivot



shaft, opposite portions to said pawls of said unitary member being made engageable with said holding member and serving as winding-up and winding-off direction holding portions for holding said winding-up and winding-off pawls relative to said operating lever, respectively, and a distance between a center of said pivot shaft and said winding-off direction holding portion being larger than a distance between the center of said pivot shaft and said winding-up direction holding portion of said unitary member.

4,468,006

CONTINUOUS WINCH

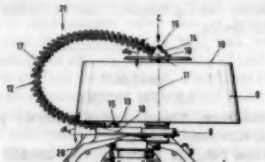
Egon Frommherz, Steinen, Fed. Rep. of Germany, assignor to Rotzler GmbH and Co. Spezialfabrik für Seilwinden und Hebezeuge, Steinen, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 421,955

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142329

Int. Cl.³ B66D *3/00, 1/26*

U.S. Cl. 254—389 **7 Claims**



1. A continuous cable winch, including a winch frame, said winch comprising:

at least one cable drum arranged within said winch frame for receiving cable under load;

a cable storage drum located externally of said winch frame for receiving a non-loaded cable section from said at least one cable drum; and

a flexible guide located in the region between said winch frame and said cable storage drum; said guide having coils with coil spacing including radially open portions over its periphery and entire length thereof to permit dirt stripped from the cable to discharge laterally therefrom, and having two ends, one of which is secured to said winch frame, and the other of which is secured to said cable storage drum; in a location remote from said winch frame said guide being adapted to receive said non-loaded cable section therein with play from said at least one cable drum and guide same to said cable storage drum, and mounting means securing said ends of the flexible guide to the winch frame and cable storage drum whereby the guide forms a substantially semi-circular loop to facilitate vibration of said flexible guide causing a cleaning effect to occur as to dirt loosened from the cable and allowed to drop out of said guide via said radially open portions.

4,468,007

OXY CUTTING TORCH

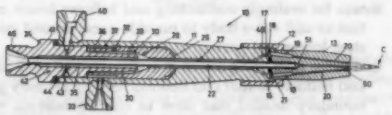
Nicholas T. E. Dillon, 10 East St., Magill, State of South Australia, Australia

Filed Jun. 13, 1983, Ser. No. 503,870

Claims priority, application Australia, Jun. 15, 1982, PF4431

Int. Cl.³ B23K *7/00*

U.S. Cl. 266—48 **4 Claims**



1. An oxy cutting torch having a body, oxygen and acetylene fittings fixed with respect to the body and a nozzle on the downstream end of the body,

an end member at the upstream end of the body, said oxygen fitting being on said end member,

a tube extending from said end member through the body to said nozzle and defining a central passage through which oxygen passes when the torch is in use,

a spacer member within the body between said end member and said nozzle, the spacer member surrounding said tube and defining therebetween an annular elongate passage which extends part way through the end member and the body and through which oxygen and acetylene pass,

said central passage opening into a central oxygen emitting aperture in the nozzle, said elongate passage opening into a plurality of elongate combustible gas emitting apertures in the nozzle, said combustible gas emitting apertures converging in a downstream direction such that the projections of their central axes all intersect the projection of the central axis of the central oxygen emitting aperture at a single convergence point.

4,468,008

FEEDER APPARATUS FOR MELTING FURNACES, PARTICULARLY FOR PLASMA MELTING FURNACES

Konrad Primke, Mölkau; Peter Papsdorf, Leipzig; Günther Pohle, Rackwitz, and Klaus-Peter Trautmann, Leipzig, all of German Democratic Rep., assignors to VEB Mansfeld Kombinat Wilhelm Pieck, Eisleben, German Democratic Rep.

Filed Jul. 13, 1983, Ser. No. 503,480

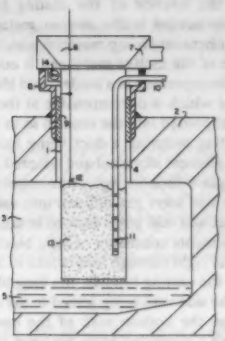
Claims priority, application German Democratic Rep., Apr. 6, 1982, 238778

Int. Cl.³ C21C *5/42*

U.S. Cl. 266—99 **7 Claims**

1. Charging apparatus for melting furnaces, especially plasma arc furnaces, for the continuous melting of preferably prepared light metal scrap material, comprising a shaft (4) arranged in an opening (1) of the brick works (2) of the furnace and movable axially and having a lower end extending up to the upper surface of the melting bath (5), a filling funnel (6) arranged on the charging side of the shaft and including an exhaust ring nozzle (7), wherein the shaft (4) is guided in a guiding bushing (8) welded to the outer wall of the furnace and

provided with sliding strips (9), compressed air pipings (10) for the supply of combustion air through the upper portion of the



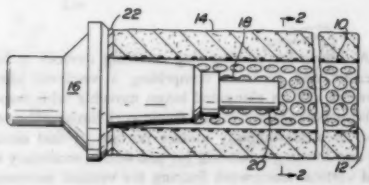
shaft (4) and provided directly below the charging funnel (6) and, a mechanical shaker (14) arranged above the shaft (4) for the provision of axial oscillations.

4,468,009

REFRACTORY PROTECTION TUBE FOR IMMERSION MOLTEN METAL DEVICES

Harry G. Clauss, Delran, N.J., and John R. Wiese, Dresher, Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Jul. 5, 1983, Ser. No. 510,514
Int. Cl.³ H01V 1/02
U.S. Cl. 266—99 7 Claims



1. An immersion device for immersion in a molten metal to determine a parameter of said molten metal comprising:

a parameter determining element,

a tube having a plurality of perforations therein, said perforated tube being adapted to receive said parameter determining element in one end thereof;

a refractory fiber coating formed on the outer surface of said perforated tube said perforations being sufficiently distributed about said tube to permit the formation of said refractory fiber coating by drawing a partial vacuum on the inside of said tube; and

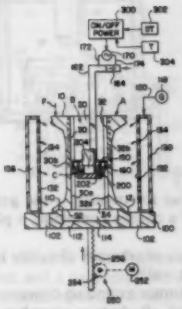
means for sealing said parameter determining element to said refractory fiber coating at said one end of said perforated tube.

4,468,010

METHOD AND APPARATUS FOR QUENCH HARDENING THIN-WALLED, ELONGATED WORKPIECES

Donald E. Novorsky, Cleveland, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Division of Ser. No. 285,788, Jul. 22, 1981, Pat. No. 4,401,485.
This application Apr. 13, 1983, Ser. No. 484,559
Int. Cl.³ C21D 1/10
U.S. Cl. 266—123 3 Claims



1. An apparatus for quench hardening to a selected depth the inner surface of an axially extending bore in an elongated, thin-walled metal workpiece having an outer radially extending surface, which bore has a selected cross-sectional shape in a direction transverse to the elongated axis of said workpiece and bore, said apparatus comprising:

(a) an inductor with an outer shape generally matching, but smaller than, said cross-sectional shape of said bore;

(b) means for supporting said workpiece with said axis extending vertically;

(c) means for energizing said inductor with a known frequency and a selected power level;

(d) external quench means surrounding said supported workpiece and in fixed relation thereto for directing fluid quench against the said outer surface of said workpiece;

(e) internal quench means fixed to and associated with said inductor at a location therebelow for directing fluid quench against the said inner surface of said workpiece, said inductor and internal quench means being vertically movable as a unit through the said bore of and relative to both said supported workpiece and said external quench means;

(f) means for moving said energized inductor and associated internal quench means downwardly through said bore to inductively heat said inner surface without applying quench fluid thereto from said internal quench means;

(g) means for discharging fluid quench from said external quench means during said inductive heating downwardly through said bore whereby to cool the said outer surface of the workpiece;

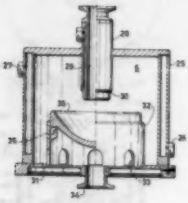
(h) means for subsequently moving said energized inductor and associated internal quench means upwardly through said bore to progressively heat the said inner surface of said workpiece; and,

(i) means for discharging fluid quench from said internal quench means during said inductive heating upwardly through said bore whereby to cool the said inner surface of the workpiece.

4,468,011
DEVICE FOR THE RECOVERY OF MERCURY

Ake Sikander; Ake Björkman, and Günther Jönsson, all of Karlskrona, Sweden, assignors to Lumalampan Aktiebolag, Karlskrona, Sweden

Filed Nov. 18, 1982, Ser. No. 442,767
Claims priority, application Sweden, Dec. 1, 1981, 8107177
Int. Cl.³ C22B 9/04
U.S. Cl. 266—149 11 Claims



1. An afterburner for treating waste gas obtained from the decomposition of a charge containing a plastic material comprising:

walls defining an afterburner chamber including a top wall and a bottom wall;

a flame basket burner extending downward through said top wall into said afterburner chamber, said flame basket burner comprising a passageway extending substantially along the vertical axis of said flame basket burner for passing waste gas into said afterburner chamber at one end thereof; a plurality of ducts for passing combustion gases, said ducts extending substantially along the vertical axis of said flame basket burner and circumferentially surrounding said passageway, said ducts having respective openings at an end thereof adjacent said one end of said passageway and positioned at an angle with respect to the vertical axis of said flame basket burner whereby the flames emerging from the openings of said ducts are outwardly directed and have a substantially conical basket shape;

deflecting means opposite and spaced from said flame basket burner for receiving said basket shaped flames and deflecting said flames inwardly towards the center of said afterburner chamber; and

means for evacuating said treated waste gas from said afterburner chamber.

4,468,012
DEVICE FOR THE REMOVAL OF INCLUSIONS CONTAINED IN MOLTEN METALS

Jean-Charles Daussan, Metz; André Daussan, Longeville les Metz, and Gérard Daussan, Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

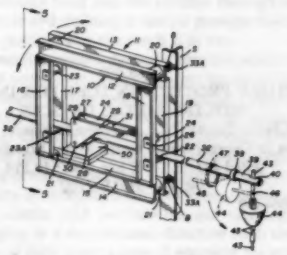
Filed Nov. 2, 1982, Ser. No. 438,491
Claims priority, application France, Nov. 13, 1981, 81 21229
Int. Cl.³ C21C 5/48
U.S. Cl. 266—220 5 Claims

1. A device for removing inclusions and especially oxides from the molten metal which is poured into a casting tundish, wherein said device comprises elements which are removably placed within the interior of the casting tundish and are adapted to be immersed in the molten metal, said elements being formed of heat-insulating material which is sinterable at the temperature of the molten metal and is composed of inorganic particles incorporated in a binder, said binder comprising organic material which is decomposable at the temperature of the molten metal poured into the tundish so as to form pores in said heat-insulating material, a duct being formed within the interior of each element aforesaid and adapted to be connected to a supply of gas which is inert with respect to the molten metal, whereby said inert gas diffuses into said molten metal through said duct and said pores formed in said heat-insulating material, said elements consisting of long blocks, a duct being adapted to extend right through said blocks to the full height of the side wall of the casting tundish, the long blocks which are placed against the side wall being joined to the opposite ends of blocks placed on the bottom wall of the casting tundish in order to establish a communication between the ducts of said side-wall blocks and bottom-wall blocks.

4,468,013
DEVICE FOR PLACING SLAG RETENTION DEVICES IN TAPPING CONVERTERS

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Jul. 22, 1983, Ser. No. 515,997
Int. Cl.³ C21C 5/48
U.S. Cl. 266—272 8 Claims

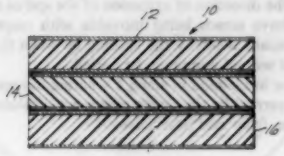


1. A device for placing slag retaining devices in tapping converters and furnaces comprising a vertically disposed framework and an elongated boom movable with respect to said framework, means in said framework limiting the vertical motion of a substantially middle portion of said elongated boom and forming a fulcrum for said boom, secondary means in said vertical framework limiting the vertical movement of said elongated boom, said secondary means spaced horizontally with respect to said first mentioned means, at least one arm pivoted to said vertical framework adjacent said first guide means and extending toward said secondary guide means and third guide means on the free end of said arm for engaging said elongated boom and a counterweight attached to the free end of said arm for balancing said elongated boom over said fulcrum, means for rotating said elongated boom on its axis, an elongated member in said elongated boom and movable in coplanar relation thereto and means on said elongated boom for imparting axial motion to said elongated member, jaw formations on one end of said elongated boom and said elongated member for detachably engaging an object carried thereby into said tapping converter and means mounting said vertically disposed framework for swingable motion relative to a fixed vertical support.

4,468,014
COMPOSITE LEAF SPRING

John R. Strong, King County, Wash., assignor to Paccar, Inc., Bellevue, Wash.

Continuation-in-part of Ser. No. 186,998, Sep. 15, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,210
Int. Cl.³ F16F 1/22
U.S. Cl. 267—47 13 Claims



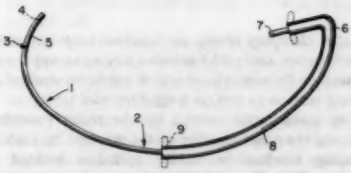
1. A composite leaf spring for use in a vehicle suspension system or the like, comprising:
a pair of metal outer skins; and
a stiff plastic core disposed between and bonded to each of said outer skins, said spring being further defined to meet the following criterion:
If F equals the static loaded force (in lbs) exerted on the spring, which is supported at its ends;
L equals the length of the spring (in inches) between the end supports;
N equals the number of composite leaves in the spring (each leave comprising two skins bonded to a core); and
T_s equals the thickness (in inches) of each skin in each composite leaf;
then:

$$T_s \leq (FL/N)^{\frac{1}{2}}/1500.$$

4,468,015
WIRE TENSIONING APPARATUS

Jan H. Wier, Burleigh, Bulls, New Zealand

Filed May 12, 1982, Ser. No. 377,428
Claims priority, application New Zealand, May 14, 1981, 197099
Int. Cl.³ F16F 1/00
U.S. Cl. 267—71 4 Claims

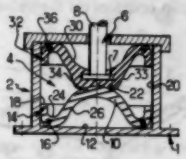


1. A wire tensioning member for providing a spring tension in a fence wire, comprising a spring steel member of a resiliently deformable compound curvature including a body portion having a generally elongate semi-elliptically curved shape, a first curved end portion extending from said generally elliptically curved body portion, a wire receiving aperture or recess in said first end portion, a wire receiving portion about which the wire may be wound adjacent to the end of said first curved end portion, a second end portion extending from said generally semi-elliptically curved body portion, an engaging portion on said second end portion adapted for removably engaging a fence member, and an insulating handle provided on said body portion, said engaging portion being an inwardly depending elongate engaging portion for removable and pivotable engagement of said wire tensioning member in a fixed support member and in its untensioned form is approximately aligned with an imaginary bisecting line of the semi-elliptical shape of the body portion which approximately bisects the medial portion of the curvature of the first curved end portion of said wire tensioning member.

4,468,016
SHOCK AND/OR VIBRATION DAMPING DEVICE FOR USE BETWEEN A SUPPORTING ELEMENT AND A SUPPORTED ELEMENT

André L. Pineau, 12, rue du Béarn, 92210-Saint-Cloud

Filed Jul. 27, 1981, Ser. No. 287,298
Claims priority, application France, May 8, 1981, 81 09252
Int. Cl.³ B60G 11/22; F16F 1/36; F16J 15/52
U.S. Cl. 267—141 12 Claims



1. A shock and/or vibration damping device for use between a supporting element and a supported element, comprising a body adapted to be assembled to one of said elements including a substantially cylindrical cavity having a cavity side wall and a cavity bottom wall, a piston comprising a piston head situated in said cavity and a piston rod, the rod being adapted to be assembled to the other one of said elements and the head being embedded in the mass of a resiliently deformable piston head membrane, and at least one resiliently deformable supporting membrane arranged in said cavity and interposed between the piston head and the cavity bottom wall confronting it, each membrane having a substantially bell-shaped major portion, the shape of the surface of the piston head membrane is at least partially conformed to the shape of the surface of the said supporting membrane on which it bears; the piston head membrane and the supporting membrane are each provided with a respective peripheral skirt portion which is directed towards the top of the respective membrane with a point of inflection defined by the junction of each said peripheral skirt portion and the bell portion of the respective membrane, the peripheral skirt portion thickness of each of said piston head supporting membranes is smaller than the thickness of the membrane major portion to form a thinner, more flexible lip, said flexible lip of said piston head membrane and said supporting membrane freely and slidingly bearing against the side wall of the cavity of said body, said thinner lip having a reverse concavity with respect to that of the membrane bell-shaped major portion, and a stiffening element is at least partially embedded in the mass of at least one membrane close to said point of inflection defined by the junction of said peripheral skirt portion and the bell portion of said at least one membrane provided with said stiffening element.

4,468,017
VACUUM ZONE CONTROL VALVE

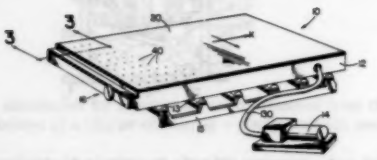
Robert J. Pavone, South Windsor, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed May 7, 1982, Ser. No. 375,982
Int. Cl.³ B25B 11/00
U.S. Cl. 269—21 8 Claims

1. In a vacuum holding system having a table defining a workpiece engageable surface divided into contiguous vacuum zones from which individual conduits extend, each individual conduit being associated with a respective vacuum zone, and a vacuum source from which a single conduit extends, the improvement comprising:

a housing having an outlet end adapted to be secured to the single conduit extending from the vacuum source, and a central through-opening extending along an axis through the housing from the outlet end of the housing, the through-opening having a conically shaped portion with the smaller end of the conical shape being located adjacent the outlet end of the housing, the housing defining a plurality of radially extending passageways between the conically shaped portion of the through-opening and the housing exterior, the passageways each having an inlet opening at the exterior of the housing and secured to an individual conduit associated with a respective vacuum zone, and

a plug having a conically shaped portion rotatably received in sealing relationship with the conically shaped portion of the central through-opening of the housing when vacuum from the pump operates on the valve and pulls the plug



toward the outlet end of the housing, the plug being supported in the housing for rotation between a plurality of angular positions with respect to the housing, the plug including a knobbed end opposite the outlet end of the housing to permit an operator to rotate the plug relative to the housing, the plug having a central cavity defined therein and communicating with the outlet end of the housing and through the conically shaped portion of the plug with a first of the housing passageways when the plug is in a first angular position with respect to the housing to provide a continuous airflow path from one vacuum zone to the vacuum source, and which cavity also communicates with the first and a second of the housing passageways when the plug is in a second angular position with respect to the housing to provide a continuous airflow path from said one vacuum zone and another vacuum zone to the vacuum source.

4,468,018

DEVICE FOR HOLDING LOGS FOR SAWING

Geoffrey S. Vaizey, South Chailey, England, assignor to Glanfield Lawrence (Concessions) Ltd., Brighton, England

Filed Jul. 28, 1982, Ser. No. 402,610

Int. Cl.³ B25B *1/02*

U.S. Cl. 269—54.5 **15 Claims**

1. A device for holding a log for sawing comprising elongated post means, said post means having an axis, means fixedly supporting at least a first pair of log engaging spikes on said post means, said supporting means spacing said spikes of said first pair from the axis of said post means, and sleeve means closely fitting around and slidably mounted on said post means and carrying at least a second pair of log engaging spikes, the spikes of said second pair being disposed at a greater distance from the axis of said post means than are said spikes of said first pair and extending in a direction which is generally opposite to the direction of extension of the spikes of said first pair, said sleeve means being movable with respect to said supporting means whereby the spacing between the spikes of said first and second pairs may be varied.

2. A device as claimed in claim 1 wherein the spikes of said second pair carried by the sleeve means are displaced substantially 200 mm from said post means.

4,468,019

PALLET CLAMPING SYSTEM FOR MACHINE TOOLS

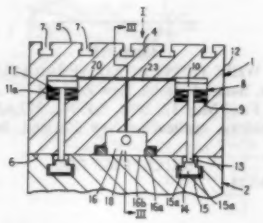
Siegfried Staudenmaier, Laubach, Fed. Rep. of Germany, assignor to A Römheld GmbH & Co. KG, Laubach, Fed. Rep. of Germany

Filed May 26, 1982, Ser. No. 382,326

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121330

Int. Cl.³ B23Q *7/00*

U.S. Cl. 269—56 **11 Claims**



1. A pallet clamping system for machine tools comprising:

a pallet member, said pallet member having an upper clamping surface for workpieces which are to be worked and a bearing surface to rest on a machine tool table;

clamping mechanisms carried by the pallet member for clamping the pallet member on the machine tool table, the clamping mechanisms having cylinders located completely within the pallet member, at least one-sidedly pressure fluid loadable pistons in said cylinders, and piston rods secured on the pistons, said piston rods projecting through the bearing surface and carrying tongues which fit into conventional table slots of a machine tool table;

a pressure fluid coupling including a first coupling part located on the pallet member, and a pressure fluid line system extending in the pallet member to said cylinders for connecting said cylinders to the first coupling part for pressurizing of said pistons;

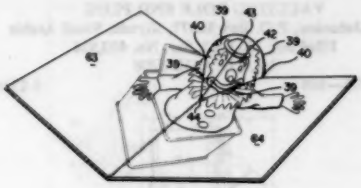
a moving mechanism, which moving mechanism can engage the pallet for moving same with respect to said table, said pressure fluid coupling including a second coupling part which can engage the first coupling part and is located on the moving mechanism, which second coupling part is connected to a fluid pressure source.

4,468,020

METHOD AND APPARATUS FOR PRODUCING POP-UP BOOKLETS

Gerald L. Wallace, Pewaukee, Wis., assignor to The Wessel Company, Elk Grove Village, Ill.

Filed Jun. 7, 1982, Ser. No. 386,008
Int. Cl.³ B41F 13/58
U.S. Cl. 270—5 22 Claims



1. A method for manufacturing a plurality of pop-up booklets in a continuous, in-line process, said method comprising:

providing a continuous web of paper having a pair of longitudinal marginal parts and divisible into a plurality of web portions extending in end to end relation in a longitudinal direction on said web;

advancing said continuous web downstream in a longitudinal direction along a predetermined path;

providing a folding station at a first location on said path;

folding one marginal part of said web into lapping relation with at least part of the remainder of the web, at said folding station, to provide at least part of the lateral dimension of said web with a double ply thickness downstream of said folding station;

forming a longitudinal fold line on said web as a result of said folding step;

providing a cutting station at a location on said path downstream of said folding station;

cutting a predetermined pop-up outline on a web portion, through the double ply thickness thereof, to form one-half of the pop-up outline in each ply, as that web portion passes said cutting station;

forming on said web portion, in conjunction with said pop-up outline, a perforated line extending through the double ply thickness of the web portion to form a pop-up fold line in each ply;

said cutting step comprising forming, on each lap of the web portion, a pop-up outline-half extending from a pop-up outline midpoint at said longitudinal fold line, along the web, to a pop-up outline end;

said step of forming said perforated line comprising forming, on each lap of the web portion, a pop-up fold line extending from said longitudinal fold line, at a location thereon longitudinally displaced from said pop-up outline midpoint, to an end of the pop-up outline, whereby each portion of said web which has undergone said cutting and forming steps includes a symmetrical pop-up defined by said pop-up outline and said pop-up fold lines, with the web's longitudinal fold line extending through the middle of said pop-up;

reverse folding said pop-up by urging it inwardly along that part of said longitudinal fold line extending through the middle of said pop-up;

and then severing from the web each portion thereof containing a reverse folded pop-up;

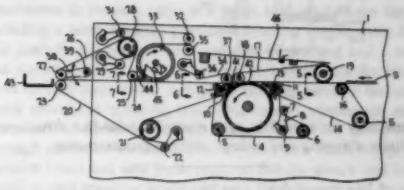
at the time of said severing step, each of said cutting, forming, reverse folding, and severing steps being performed on a respective portion of the continuous web simultaneously with the performance of each of the other steps.

4,468,021

PICKUP AND DEACCELERATION DRIVE OF A SHEET CONVEYOR

Friedrich Weber, Brensbach, Fed. Rep. of Germany, assignor to Maschinenfabrik Goebel GmbH, Darmstadt, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 420,483
Claims priority, application European Pat. Off., Sep. 18, 1981, 817100464
Int. Cl.³ B65H 39/08
U.S. Cl. 270—60 2 Claims



1. An arrangement for the drive of a sheet conveyor connected to a machine adapted for processing sheets of paper, film, fabrics, metals, or the like, the conveyor including a collecting cylinder and a first tape guide system for conveying the sheets to a pick-up station and being driven at a constant speed by a drive means of the machine, a second tape guide system including a roll journal of a tape guide roll driven at a variable speed for conveying the sheets from the pick-up station and delivering them from the machine at a decelerated speed, the arrangement comprising a planetary gear train including first and second planetary gear drives, including internal gears rotatable about the axis of said roll journal, planetary gears rotatable within said internal gears and sun gears rotatable within said planetary gears, means for uniformly rotating said internal gears in opposite directions about said axis, said sun gear of said first gear drive being mounted on said roll journal, a flywheel mounted on said sun gear of said second gear drive for rotation therewith, and means for intermittently driving said planetary gears for driving said second tape guide system at said variable speed as said sun gears rotate in said opposite directions about said axis, said intermittent driving means including crank lever means interconnecting said sun gears with said uniform rotation means, whereby inertia forces resulting from the intermittent drive of said second tape guide system are substantially dampened by the counter-rotation of said flywheel relative to said tape guide roll.

4,468,022

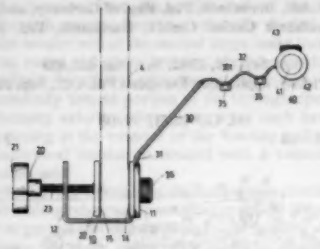
SIT-UP EXERCISE APPARATUS

Han-Chou Wu, No. 145, Jen-Ho Rd., Tainan, Taiwan

Filed Jul. 8, 1982, Ser. No. 396,469
Int. Cl.³ A63B 23/02
U.S. Cl. 272—93 1 Claim

1. A disassembled sit-up exercise apparatus having a clamping vise-like structure that can be securely attached to the bottom of a door comprising: means for restraining the feet of an exerciser when performing a sit-up exercise; support means releasably but rigidly connected to said structure and extending therefrom for supporting said foot restraining means above the base of said structure, said support means having a stair step configuration at an end portion for locating said foot restraining means at different heights so as to accommodate different size feet, and said support means being in the form of an elongated plate member extending from said clamping vise-like structure and having, one end thereof downwardly extending so as to be releasably but rigidly affixed to said clamping vise-like structure and another end thereof successively bent into a form resembling a plurality of stair steps; and means for releasably but rigidly securing said foot restraining

means at any location on said support means; whereby when said apparatus is disassembled, said releasable foot restraining



means may be stored in said clamping vise-like structure to facilitate shipping and reduce storage requirements.

4,468,023

AQUATIC NECK EXERCISE ASSEMBLY

Daniel S. Solloway, 1315 18th St., Woodward, Okla. 73801

Continuation-in-part of Ser. No. 310,788, Oct. 13, 1981, Pat. No. 4,416,451, which is a continuation-in-part of Ser. No. 79,966, Sep. 28, 1979, Pat. No. 4,311,306. This application Sep. 20, 1982, Ser. No. 420,021

Int. Cl.³ A01B *23/00*

U.S. Cl. 272—94 **7 Claims**

1. An aquatic helmet exercise assembly for use in exercising underwater to strengthen the user's neck muscles, comprising:

a substantially rigid impact-resistant cap of water-impervious plastic for substantially covering the top, sides and back of the user's head;

adjustable strap means for adjustably securing said cap to the user's neck and head;

longitudinal substantially rigid water-engageable fin means of water-impervious plastic extending generally upwardly, forwardly and rearwardly of said cap along a generally symmetical axis of the user's body generally between the user's ears and in general alignment with the user's nose, said longitudinal fin means having a curved and arcuate outer edge and lateral facing, generally planar, substantially solid water-engageable surfaces for laterally engaging and deflecting the water and exerting hydrodynamic fluid resistive forces and torque on the user's neck as said longitudinal fin means is moved sideways in the water; and

transverse, substantially rigid, water-engageable side fin means of water-impervious plastic extending generally upwardly and laterally ouwardly of said cap and positioned generally perpendicular to said longitudinal fin means along a transverse axis of the user's body in general alignment with the user's ears, said transverse side fin means cooperating with said longitudinal fin means to define generally cross-shaped fins as viewed from the top of the aquatic helmet exercise assembly, said transverse side fin means having a curved and arcuate outer edge, said transverse side fin means having a forwardly facing generally planar, substantially solid, water-engageable surface and a rearwardly facing, generally planar, substantially solid, water-engageable surface for engaging and deflecting water and exerting hydrodynamic fluid resistive forces and torque on the user's neck as said transverse side fin means is moved forwardly and backwardly, respectively, in the water.

4,468,024

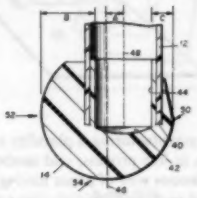
VAULTING POLE END PLUG

David F. Johnston, P.O. Box 15377, Riyadh, Saudi Arabia

Filed Jul. 29, 1982, Ser. No. 402,926

Int. Cl.³ A63B *5/06*

U.S. Cl. 272—104 **6 Claims**



1. A pivot plug for pole vaulting use at the bottom end of a vaulting pole for improving pole vaulting performance, said pole vaulting pivot plug comprising a body having a substantially spherically shaped lower portion extending around a central vertical axis of said body and means defining a cavity in said pivot plug for receiving the bottom end of a vaulting pole, said cavity means being offset from said vertical axis of said body so that the inserted bottom of said pole vaulting pole is positioned closer to one side of said spherically shaped lower portion than the other so that an eccentric portion is defined in said body in that side farthest from the cavity and the pole.

4,468,025

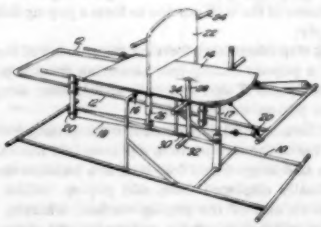
EXERCISE BENCH

Mihai Sferle, 147-25 10th Ave., Whitestone, N.Y. 11357

Filed Sep. 27, 1982, Ser. No. 424,598

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—120 **3 Claims**



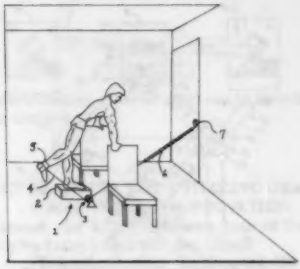
1. A body building apparatus comprising a frame, a bench, support means on said frame for adjustably mounting said bench thereto in a plurality of inclined positions, pulley means mounted on said frame, cable means operatively connected to said pulley means and said bench so as to move said bench against the user's weight by stressing said cable, a back rest adjustably mounted on said bench so as to be positionable into a plurality of positions, wherein one of said positions said back rest is mounted behind the user and not in operative interconnection with the cable and in a second position said back rest is mounted forward of the user and in operative interconnection with the cable for stressing said cable.

4,468,026

LEG EXERCISE APPARATUS WITH ELEVATED STAND AND LOWER LINE GUIDING MEMBER

Carl D. Roark, P.O. Box 375, Cassville, Mo. 65625

Filed Apr. 29, 1982, Ser. No. 372,987
Int. Cl.³ A63B 21/12
U.S. Cl. 272—136 6 Claims



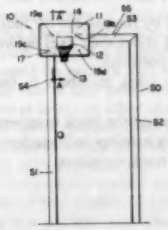
1. An improved exercise apparatus for exercise of the leg comprising an elevated stand having a top surface and side portions extending downwardly therefrom, for a person to position one foot upon such that the other foot, which is of the leg to be exercised, is suspended lateral to said stand, such stand having at least one line guiding member, said line guiding member being positioned laterally on at least one side portion and lower than the top surface of said stand, a line held by said line guiding member, said line having body attachment means at one end thereof with the other end being attached to tension creating means, said tension creating means having anchoring means generally opposite the point of line attachment.

4,468,027

MINIATURE BASKETBALL BACKBOARD ASSEMBLY ATTACHABLE TO A DOORFRAME, DOOR, OR THE LIKE

Charles A. Pangburn, 4635 Seven Hills Rd., Evansville, Ind. 47711

Filed Nov. 26, 1982, Ser. No. 444,621
Int. Cl.³ A63B 63/08
U.S. Cl. 273—1.5 R 5 Claims



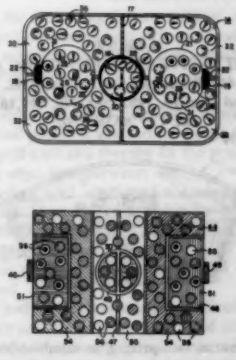
1. A miniature basketball backboard assembly attachable to a door frame, door, or the like, said assembly comprising: a backboard, said backboard having a substantially flat vertical surface; a basketball hoop, said hoop being attached to said backboard and extending horizontally therefrom; said backboard having a set of horizontal transom brace holes therethrough positioned along a horizontal line above said hoop, said backboard further having a horizontal jamb brace hole therethrough positioned below said horizontal line; a horizontal transom brace, said horizontal transom brace including a transom flange portion extending horizontally, said transom flange portion having vertical holes therethrough for attachment to the ledge of a transom, said transom brace further including a backing portion, said transom backing portion extending downward from said transom flange portion between said backboard and a transom, said transom backing portion defining a set of horizontal holes for attachment to said backboard, said transom backing set of horizontal holes being aligned with said backboard set of horizontal transom brace holes, said transom backing portion including shock absorbant material; a vertical jamb brace, said vertical jamb brace including a jamb flange portion extending vertically, said jamb flange portion having at least one horizontal hole therethrough for attachment to the side edge of a jamb, said jamb brace further including a jamb backing portion extending horizontally from said jamb flange portion between said backboard and a jamb, said jamb backing portion defining a horizontal hole for attachment to said backboard, said jamb backing portion including shock absorbant material; brace/backboard attachment members, said brace/backboard attachment members being fitted through the holes in said backboard and into the holes in said transom brace and said jamb brace to fixedly attach said backboard to said transom brace and said jamb brace; and frame/brace attachment members fittable through the holes in said transom brace and said jamb brace and into the transom and jamb respectively to fixedly attach said transom brace and said jamb brace to the transom and the jamb respectively.

4,468,028

PLAYING BOARD SIMULATING AN ACTION GAME

Frank H. Mustin, Lansdowne, Pa., assignor to Fleer Corp., Philadelphia, Pa.

Filed Jan. 6, 1984, Ser. No. 568,580
Int. Cl.³ A63F 3/00
U.S. Cl. 273—85 R 11 Claims



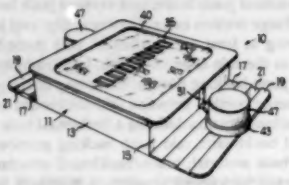
1. A playing board apparatus comprising a play area having a plurality of zones, one of said zones being a starting zone, at least two of said zones being goal zones, at least two zones being scoring zones, each of said scoring zones being adjacent a separate goal zone, and at least two zones being scrimmage zones, a plurality of indicia spots in each of said zones except the goal zones, and mask means overlying each spot and in its active condition covering the indicia of the spot, the starting zone having spots with indicia each coupled to a separate one of said two scrimmage zones, the scoring zone having selected spots with indicia coupled to the first scrimmage zone, selected spots with indicia coupled to the second scrimmage zone, and selected spots with indicia coupled to the adjacent goal zone representing a score, said mask means being capable of inactivation to expose the indicia of a single spot.

4,468,029

PORTABLE PNEUMATIC ACTION GAME

Ralph J. Kulesza; Wayne A. Kulesza; Henry Arias, all of Chicago, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 6, 1982, Ser. No. 447,283
Int. Cl.³ A63F 7/00
U.S. Cl. 273—108 **20 Claims**



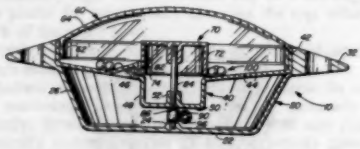
1. A portable pneumatic action game comprising:
a base;
a playing surface on the base;
a plurality of separate elongated channels in side-by-side array on the playing surface;
each of the channels having an aperture at each end;
a transparent cover over the array;
a combination pump and nozzle means mounted on the base at each end of the playing surface and being movable from side-to-side for selectively registering the nozzle in pneumatic communication with the aperture of each of the channels at the respective end; and
a playing piece disposable in each of the channels for propulsion along the entire length of the channel in response to pneumatic pressure from the pump directed into the channel through the nozzle at the one end and ejection from the channel at the other end.

4,468,030

ROTATING SELECTIVE ELEMENT GAME APPARATUS

David L. Allen, 447 W. Sunset Cir., Mesa, Ariz. 85201

Filed Dec. 13, 1982, Ser. No. 449,162
Int. Cl.³ A63B 7/02
U.S. Cl. 273—109 **8 Claims**



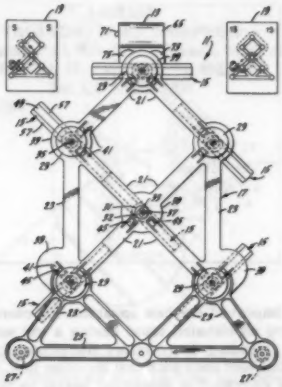
1. Game apparatus, comprising, in combination:
housing means;
insert means within the housing means, including
an inwardly and downwardly sloping floor, and
a receptacle extending downwardly from the sloping floor;
a plurality of rolling elements disposed on the sloping floor and adapted to roll into the receptacle;
rotatable cage means disposed above the receptacle, including
a cylindrical wall disposed above the receptacle for preventing the rolling elements from rolling into the receptacle, and
an aperture extending through the cylinder wall to allow a rolling element to roll into the receptacle; and
means for rotating the cage means to selectively align the aperture with a rolling element.

4,468,031

THREE-DIMENSIONAL GAME WITH ROTATABLE TRACK PIECES FOR SELF-PROPELLED VEHICLE

Gordon A. Barlow, and John R. Krutsch, both of Glenview, Ill., assignors to Gordon Barlow Design, Skokie, Ill.

Filed Sep. 20, 1982, Ser. No. 419,960
Int. Cl.³ A63F 9/14
U.S. Cl. 273—110 **6 Claims**



1. A three-dimensional, player manipulatable game including:
a self-propelled vehicle having a plurality of wheels,
a lattice-like support frame,
a plurality of track members each rotationally supported on the lattice-like support frame and providing a vehicle supporting path located in a plane extending at right angles to the lattice-like support frame,
the track members being located at the intersections of the lattice-like support frame and being rotatable between a plurality of predetermined positions with the track members being dimensioned so that in some of said predetermined positions the paths of a set of adjacent track members will form a continuous path upon which the vehicle may travel from one track member to another and in others of said predetermined positions the track members will provide a discontinuity in the path of travel of the vehicle,
means manipulatable by the players for individually rotating the track members about their axes between said plurality of predetermined positions,
means to detain the track members in the predetermined positions, and
means on the vehicle and the track members for holding the vehicle on the track member independent of the rotational orientation of the track members.

4,468,032

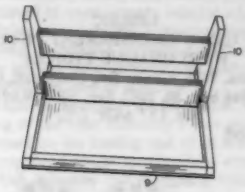
CARD HOLDER

Ralph E. Stewart, Manvel, Tex. 77578

Filed May 23, 1983, Ser. No. 497,063
Int. Cl.³ A63F 9/00
U.S. Cl. 273—148 A **4 Claims**

1. In a card holder, end members having upwardly tapered forward faces, cross members mounted on said end members,

grooves in the upper margin of said cross members and a platform extending outwardly from said cross members; said



end members slanting inwardly from top to bottom, providing means for stacking.

4,468,033

OBJECT TRANSFER TOY UTILIZING GEARS FOR COMPONENT COORDINATION

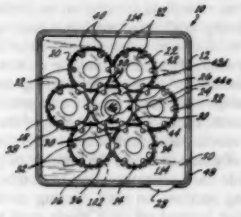
Koichi Minami, and Tohru Nishimiya, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Japan

Filed Sep. 13, 1982, Ser. No. 417,330

Claims priority, application Japan, Sep. 14, 1981, 56-136597[U]

Int. Cl.³ A63F 9/08

U.S. Cl. 273—153 S **7 Claims**



1. A toy which comprises:

a housing;

a plurality of members each movably mounted on said housing, said members positioned in an array so as each of said members is in operative association with at least three others of said members, each of said members being circular in shape and positioned with respect to one another such that the peripheries of each of said members which are in operative association with each other are positioned adjacent to each other at a tangent point;

gear means located on each of said members with the gear means on any one of said members intermeshed with the gear means on at least one other of said members such that movement of one of said members is communicated to the remainder of said members so as all of said members move in association with one another;

additional gear means intermeshed with one of said members with a portion of said additional gear means exposed from said housing in a position such that it is capable of being manipulated by the digits of a user of said toy so as to rotate said one of said members on said housing with the rotation of said one of said members communicated by said gear means to the remainder of said members so as to rotate all of said members in association with one another in response to said manipulation of said additional gear means;

each of said members including a like number of object repository means located thereon in a symmetrical array around the periphery of the members;

a plurality of objects one less than the total number of object repository means located on all of said members, one each of said objects located in each of said object repositories with one object repository vacant at any specific instance in time;

an object repository on one of any two respective associated members being aligned with an object repository on the second of said two respective associated members at their respective tangent point at a specific point of rotation of said two respective associated members and not aligned with each other at all other points of rotation;

an object capable of being transferred from the respective object repository it is located in to said vacant object repository only when said vacant repository and said respective object repository are aligned at the particular point of rotation of the two associated members on which said vacant repository and said respective repository are located.

4,468,034

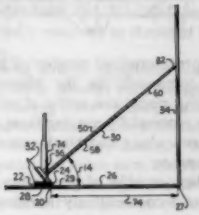
GOLF CLUB LOFT AND LIE ANGLE INDICATING DEVICE

Clovis R. Duclos, 6327 Marina Pacifica Dr., Long Beach, Calif. 90803

Filed Feb. 16, 1983, Ser. No. 467,019

Int. Cl.³ A63B 69/36

U.S. Cl. 273—183 D **17 Claims**



1. A device for measuring the errors in loft and lie angles of the face of a golf club being held in the normal ball addressing stance by the expected user of the club including:

a base member having:

horizontal platform;

a linear abutment ledge extending upwardly from said horizontal platform adapted to engage the leading edge of the golf club and thereby fix the position of the club leading edge therebetween; and

an upstanding wall positioned a predetermined distance from said linear abutment ledge having indicia of loft angle and lie angle errors thereon; and

a pointer member having:

attachment means adapted to attach to the face of the club; and

a pointer body which extends perpendicular to the face of the club and toward said indicia of loft and lie angle errors of said upstanding wall when said pointer member is attached to the face of a club whose leading edge is engaged with said linear abutment ledge.

4,468,035

WORD FORMING GAME APPARATUS

Joel M. Slepian, 306 Hunters La., Williamsville, N.Y. 14221

Continuation of Ser. No. 308,430, Oct. 5, 1981, abandoned. This application Aug. 18, 1983, Ser. No. 524,112

Int. Cl.³ A63F 3/00

U.S. Cl. 273—243 **3 Claims**

1. A word forming game apparatus, comprising:

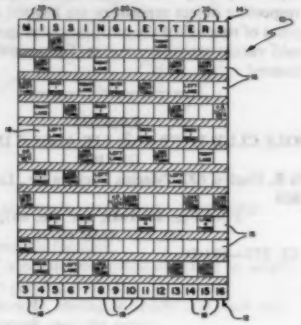
a game board having a plurality of adjacent spaces arranged to form a plurality of columns;

a starting row of spaces adjacent one edge of said columns, each space of which containing a plurality of consecu-

tively numbered starting spaces adjacent one another and in alignment with respective ones of said columns;

a finish row comprising a plurality of adjacent spaces located adjacent an opposite edge of said columns, each space of which being in alignment with respective ones of said consecutively numbered starting spaces and containing a letter of the alphabet that combines with the letters in adjacent spaces to spell the title of the game;

said adjacent spaces between said starting row and said finish row comprising a predetermined number of blank



spaces and a predetermined number of spaces containing instructional commands for the players of the game, whereby playing pieces can arrive at said finish row letters only after successfully moving from said starting row to said finish row along said blank spaces and along said instructional spaces;

a plurality of dice capable of generating numbers corresponding to said consecutively numbered starting row spaces; and

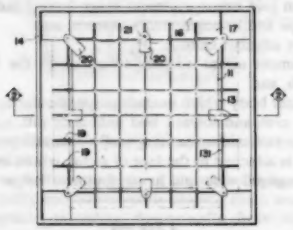
a single game piece for each player.

4,468,036

BOARD GAME APPARATUS

Konrad C. Istrati, and Delilah J. Istrati, both of Box 554, Assiniboia, Saskatchewan, Canada S0H 0B0

Filed Jan. 17, 1983, Ser. No. 458,471
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—271 **14 Claims**



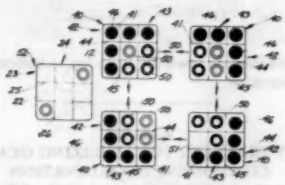
1. A board game apparatus comprising a first plate and a second plate, means mounting the plates in parallel and spaced relation, a plurality of separate square blocks which can be mounted between the plates in rows and columns such that in turn each row and each column of such blocks can be moved along its length by the introduction of a further block at one end to eject a block at the other end and trap means arranged at the end of each column and each row normally retaining the blocks in position between the plates, which trap means is individually manually movable to a release position to allow a block to be inserted into the plates and to allow a block to be ejected from between the plates.

4,468,037

CARD GAME USING TRANSPARENT PLAYING CARDS WITH OPAQUE INDICIA

A. Kenneth Kuhn, 5678 Alomar Dr., Cincinnati, Ohio 45238

Filed Sep. 30, 1982, Ser. No. 429,025
Int. Cl.³ A63F *1/02*
U.S. Cl. 273—295 **17 Claims**



1. A card game comprising:

(a) a plurality of playing cards, each playing card being of the same size and made from a transparent material, each playing card being divided into a like number of playing sections, the playing sections being similarly located on all of the playing cards;

(b) one or more indicia located on each playing card, each indicia being positioned within a playing section of the playing card, one or more playing cards having an indicia within a similarly located playing section; and

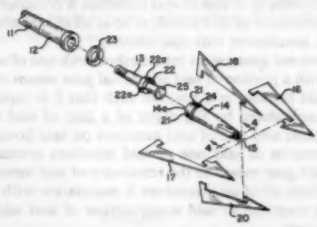
(c) guide means for aligning the playing cards in overlying relationship, said guide means comprising a plurality of guides cards, each guide card being of the same size as the playing cards, each guide card being divided into a like number of guide sections, the number of guide sections on each guide card corresponding in number to the number of playing sections on each playing card, the guide sections being located on each guide card to correspond to the locations of the playing sections on each playing card so that when a playing card is laid upon a guide card, the playing sections are in overlying relationship with the guide sections.

4,468,038

BROADHEAD ASSEMBLY FOR ARROW

Charles A. Saunders, Columbus, Nebr., assignor to Saunders Archery Co., Columbus, Nebr.

Filed May 6, 1982, Ser. No. 375,487
Int. Cl.³ F41B *5/02*
U.S. Cl. 273—422 **5 Claims**



1. In a broadhead assembly for an arrow, said broadhead assembly being of the type including a hub assembly adapted for being retained on the leading end of an arrow shaft, and a plurality of broadhead blades mountable in even arcuate relation on said hub assembly and extending radially outwardly

therefrom; an improvement wherein said hub assembly includes a tubular hub having a tapered forward end including a plurality of substantially axially and radially inwardly oriented recesses positioned in even arcuate relation adjacent said forward end defining slots between respective ones of said recesses for receiving a forward mounting portion of each said blade, and the leading point of each said blade extending forwardly of said leading end of said hub.

2. In a broadhead assembly for an arrow, said broadhead assembly being of the type including a hub assembly adapted for being retained on the leading end of an arrow shaft, and a plurality of broadhead blades mountable in even arcuate relation on said hub assembly and extending radially outwardly therefrom; an improvement wherein said hub assembly includes a tubular hub having an annular recess around a rearward portion thereof; a mounting shaft having a radially extending flange at a leading end thereof adapted for being retained by said annular recess on said tubular hub, means adjacent the trailing end thereof for affixing said hub assembly on an arrow shaft, a leading end of said hub includes slot means extending axially therein for receiving a forward mounting portion of each said blade, and the leading point of each said blade extending forwardly of said leading end of said hub.

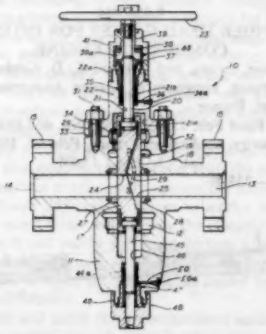
5. In a broadhead assembly for an arrow, said broadhead assembly being of the type including a hub assembly adapted for being retained on the leading end of an arrow shaft, and a plurality of broadhead blades mountable in even arcuate relation on said hub assembly and extending radially outwardly therefrom; an improvement wherein a leading end of said hub includes slot means extending axially therein for receiving a forward mounting portion of each said blade, the leading point of each said blade extending forwardly of said leading end of said hub, said plurality of broadhead blades including a pair of primary opposing blades including ends thereof adapted for juxtaposed overlying relation for added strength to the tip of said broadhead, and a pair of secondary opposing blades each having a leading end thereof adapted for abutting a side of a primary blade adjacent said leading end thereof.

4,468,039

PACKING RING CARTRIDGE WITH ADJUSTING SCREWS

Tri C. Le, Missouri City; Danny S. Meyer, Richmond, and John B. Williams, Houston, all of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 557,802
Int. Cl.³ F16J 15/12
U.S. Cl. 277—112 **6 Claims**



1. A packing structure for use in a valve having a valve body and a valve element mounted in the body for movement between an open position and a closed position relative to a flow passage through the valve with a valve stem connected to the valve element and extending through a valve stem bore in the valve body and an enlargement of said bore for accommodating a valve stem packing structure therein, said packing structure comprising:

annular packing means including at least one packing ring;

a pair of retainer rings disposed coaxial with said packing means and between which said packing means is located with one of said retainer rings being an inner retainer ring having an inwardly facing annular surface upon which the fluid pressure in the flow passage is disposed to act and the other retainer ring being an outer retainer ring provided with an outward facing external shoulder;

a packing gland adapter ring disposed coaxial with said other rings and in abutting relation with said outer retainer ring, said packing gland adapter ring being provided with external threads for accommodating its connection with an internal threaded section of said valve stem bore;

at least one washer spring of frusto-conical configuration in coaxial sleeved relation about said outer retainer ring with the innermost surface of said washer spring having its inner annular edge in abutting relation with said shoulder of the outer retainer ring and the outermost surface of said washer spring having its outer edge in abutting relation with the inner end of said adapter ring;

said packing means, retainer rings, washer spring and adapter ring being held together in a modular unit by a plurality of screws extending through aligned openings provided in said adapter ring, outer retainer ring and said packing means with the threaded ends of said screws being threadedly received in threaded bores in said inner retainer ring;

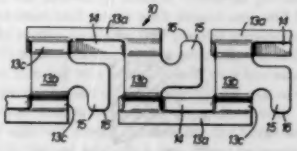
said screws being axially adjustable within said threaded bores of the inner retainer ring for applying a predetermined axial loading force on the packing means when the packing structure is installed as a modular unit in the valve stem bore of the valve body whereby the packing means is squeezed against the valve stem and the wall of the valve stem bore to effect a fluid-tight seal thereagainst which is enhanced by further energization of the packing structure by the presence of fluid pressure in the valve.

4,468,040

SPACER-EXPANDER FOR PISTONS

Robert Plant, Bradford, England, assignor to AE PLC, Rugby, England

Filed Dec. 13, 1982, Ser. No. 449,204
Claims priority, application United Kingdom, Dec. 17, 1981, 8138087
Int. Cl.³ F16J 9/06
U.S. Cl. 277—140 **4 Claims**



1. An annular spacer-expander for spacing and positioning two rails in a piston ring groove of a piston for an internal combustion engine and comprising a plurality of U-shaped members which lie in respective angularly spaced planes including the spacer-expander axis, whose arms open inwardly of the spacer-expander for urging radially inner ends of respective rails into contact with respective radial walls of the piston ring groove, which are interlinked in serpentine fashion with the arms of successive pairs of U-shaped members being interconnected on alternately opposite sides of a plane noraml to the spacer-expander axis and passing through the bases of the U-shaped members to give the spacer-expander circumferential resilience, and whose ends are bent outwardly for urging

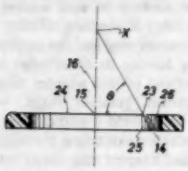
the rails into contact with an associated cylinder or liner, and also comprising a plurality of ring spacer lugs for controlling axial movement of radially outer ends of the rails, each ring spacer lug being between a pair of adjacent U-shaped members and being connected to the base of one of the pair of U-shaped members.

4,468,041

BACKUP RING FOR HYDRAULIC APPARATUS SEALS

Mistuo Yoshimura, Yamato, and Akihisa Takaoka, Fujisawa, both of Japan, assignors to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1982, Ser. No. 410,077
Claims priority, application Japan, Sep. 2, 1981, 56-130578[U]
Int. Cl.³ F16J 9/14
U.S. Cl. 277—144 20 Claims



1. In a backup ring for a hydraulic apparatus seal having a single planar cut passing completely through it, the improvement comprising locating said cut so that said cut lies in a plane which

intersects the notional central axis of the backup ring at a point outside the ring, and

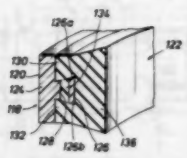
intersects the notional perpendicular plane defined by an end surface of the ring at an angle θ of less than 90°, the notional line defined by this intersection necessarily being parallel to a given radius of the ring drawn through its central axis.

4,468,042

ANTI-EXTRUSION SEALING DEVICE WITH INTERLOCKED RETAINER PORTIONS

Aaron J. Pippert, Houston, and H. T. Miser, Missouri City, both of Tex., assignors to Utex Industries, Inc., Houston, Tex.

Division of Ser. No. 322,727, Nov. 19, 1981, Pat. No. 4,428,590.
This application Dec. 22, 1983, Ser. No. 564,744
Int. Cl.³ F16J 15/18
U.S. Cl. 277—188 A 10 Claims



1. A sealing device comprising:

a first body comprising an outwardly facing base surface, a thickened base section along said base surface, and a locator section extending from said base section generally transverse to said base surface, said locator section having at least one bore extending therethrough generally parallel to said base surface;

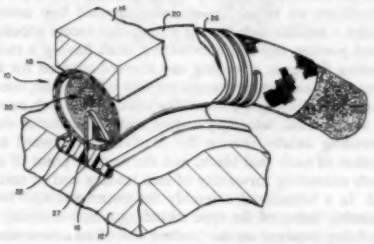
and a second body extending through said bore and having enlarged portions located generally adjacent the opposite ends of said bore, each of said enlarged portions having a dimension transverse to said bore greater than the minimum transverse dimension of said bore, and a seal portion continuous with at least one of said enlarged portions and extending away from said base section of said first body beyond said locator section.

4,468,043

HIGH TEMPERATURE SEAL

Patrick J. Brazel, 17216 Goya Ave., Granada Hills, Calif. 91344

Filed Jun. 11, 1982, Ser. No. 387,378
Int. Cl.³ F16J 15/22
U.S. Cl. 277—235 B 11 Claims



1. A bulb seal system for incorporation as a fire barrier between opposed members in an aircraft or similar structure comprising:

an outer cover member of generally circular cross section including a split base of greater thickness for attachment to one of the opposed members;

an interior helical stainless steel spring within the outer cover member and extending therealong, the interior spring being of a temperature resistant metal and having an open interior; and

a temperature resistant core member comprising a structure of refractory fibers within the spring member and extending therealong, the cover and spring being sufficiently over-sized to be partially compressed when positioned in the seal position and the interior temperature resistant core substantially filling the interior of the compressed spring, such that the system conforms to the desired fire barrier configuration during compression and expansion and presents the cover member, the spring and the uncompressed core member as successive barriers to fire.

4,468,044

CYLINDER HEAD GASKET FOR INTERNAL COMBUSTION ENGINE

Georges Ulmer, Lyons, and Bernard C. D. Genia, Venissieux, both of France, assignors to Societe Anonyme dite: Curty, Saint-Priest, France

Filed Feb. 11, 1983, Ser. No. 465,894
Claims priority, application France, Feb. 12, 1982, 82 02648
Int. Cl.³ F16J 15/08
U.S. Cl. 277—235 B 17 Claims

1. A cylinder head gasket for an internal combustion engine comprising:

a metal central plate formed with a row of openings for cylinders of said engine and a plurality of passages for liquids circulated in said engine;

respective elastomeric beads surrounding said passages and forming liquid seals, said liquid seals being disposed sym-

metrically on opposite sides of said plate and being affixed thereto; and

respective refractory annuluses lining each of said openings and defining gas seals for said openings, said annuluses being composed entirely of metal, said plate being set back from said seals at said opening, each of said annuluses comprising:

a pair of ribbed sheet metal members having said plate received between them and having respective inner ribbed perimeters extending inwardly beyond said plate into each of said openings, the ribs of said perimeters being symmetrical with respect to a plane of said plate, one of said ribbed members being coplanar with a surface of said plate, the other of said ribbed members having its perimeter offset toward said one of said ribbed members,

a first sheet metal cover member having a C-section portion reaching over said ribbed members and between said ribbed members while overlying said other ribbed member, and

a second sheet metal cover member having a C-section portion reaching around said inner perimeters and said first cover member while underlying said one of said ribbed members.

4,468,045

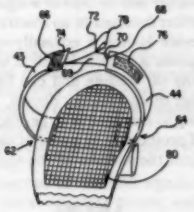
ATTACHMENT SYSTEM FOR DETACHABLE ROLLER SKATES

Philip R. Sarazen, 4 Willow St., Ottawa, Ontario, Canada

Continuation-in-part of Ser. No. 224,087, Jan. 12, 1982, abandoned. This application Jul. 29, 1982, Ser. No. 403,026

Int. Cl.³ A63C *1/18*

U.S. Cl. 280—11.3 **4 Claims**



1. In a roller skate adapted to be secured to an article of footwear and including a base member having heel stops towards the rearward end thereof, a system for securing the said roller skate to the said footwear comprising:

at least one pair of partly stiff band sections of a spring material permanently mounted toward one end and on opposite sides of said base member and extending upwardly therefrom toward each other in a curved permanently upstanding configuration,

the said band sections in each pair being joined to each other near the free ends thereof to form with the surface of the base member a continuously upstanding closed loop by a quick release adjustment means whereby the loop size may be varied while maintaining the integrity of the loop,

wherein each said partly stiff band section is biased against closure of the said loop so as to positively expand the said loop when tension on the loop is eased by said quick release adjustment,

and wherein said quick release adjustment means comprises an arrangement whereby one band section of each said pair includes at the end thereof a receptacle for a strap and the respective second band section of each pair includes a flexible strap adapted to engage said receptacle and turn back on itself where it is secured by a quick release fastener,

whereby the said system allows a user of the rollerskate to simply step in and step out of an adjustable loop which loop is always presented in the said upstanding configuration.

4,468,046

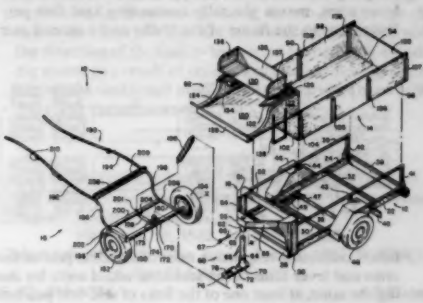
CONVERTIBLE HORSE WAGON

Frank E. Rutherford, 1203 Main St., Georgetown, Colo. 80444

Filed May 2, 1983, Ser. No. 490,292

Int. Cl.³ B60D *1/14*; B60F *5/00*

U.S. Cl. 280—416 **17 Claims**



1. A four-wheeled horse wagon which is readily adaptable into a two-wheeled towing trailer comprising:

main frame means for supporting a wagon load having two coaxially aligned wheel means operably mounted at a mid portion of the main frame for rollingly supporting said main frame;

goose neck means operably mounted on a forward portion of said main frame means for providing clearance between said forward portion of said main frame means and a front end assembly means;

front end assembly means for attachment to said goose neck means for steerably rollingly supporting the front end of said main frame means having a transversely extending front axle means for supporting wheels and having front wheels journaled at either end thereof in coaxial alignment with the central longitudinal axis of said front axle means, the front end assembly means being substantially as wide as said main frame means;

draw bar means operably attached to said front end assembly means for attaching at least one horse to the horse wagon;

ball hitch means, comprising a ball means and a socket means for mating, selectively disengagable attachment one with another, for providing limited universal pivotal attachment between said goose neck means and said front end assembly means to allow free pivotal movement of said front axle means about a tiltable generally vertical steering axis, said steering axis being defined by a line substantially perpendicular to said central longitudinal axis of said front axle means and substantially coincident with a center point of said ball means, for steering the horse wagon and to provide limited swiveling movement between said ball means and said socket means to prevent excessive loading on said draw bar in uneven terrain or surfaces of changing grade.

4,468,047

STEERING ASSEMBLY FOR TOWED VEHICLES

James R. McGhie, Brampton, and Semyon I. Fishgal, Toronto, both of Canada, assignors to American Hoist of Canada Limited, Brampton, Canada

Filed May 17, 1982, Ser. No. 378,611

Int. Cl.³ B62D *13/02*

U.S. Cl. 280—419 **6 Claims**

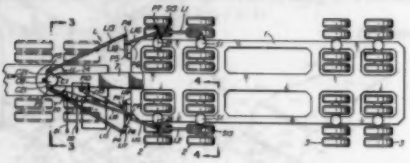
1. A trailer comprising:

(a) a rigid frame supported upon a plurality of front and rear

wheel ground engaging units, said front wheels being steerable;

(b) a gooseneck extending forwardly of the frame and having on the leading end thereof coupling means for connecting to the fifth wheel of a tractor towing vehicle; and

(c) linkage means interconnecting the fifth wheel coupling and the front steerable wheels to steer the same via rotation of said fifth wheel of the towing vehicle relative to the trailer, said linkage means comprising a first pair of links connected at one end to said fifth wheel via the coupling means and at the opposite end to a first pair of lever arms, means pivotally connecting said first pair of lever arms to the frame of the trailer and a second pair of



links connecting respective ones of the first pair of lever arms and lever arms of the steerable wheel units for steering the same, at least one of the links of said first pair being connected to the first lever arm associated therewith via a third lever arm pivotally connected to such first lever arm, a third link connected at opposite ends respectively to the fifth wheel, via said coupling means, and said third lever arm, a hydraulic control slide valve arranged mechanically in series with said link for controlling fluid to a hydraulic power cylinder unit, and a hydraulic power cylinder unit connected at opposite ends respectively to the frame of the trailer and said steering linkage means and actuated by said slide valve to assist in steering the steerable wheels.

4,468,048

SAFETY SKI BINDING

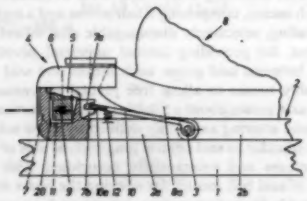
Heinz Wittmann, Vienna, and Josef Svoboda, Schwechat, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Feb. 23, 1982, Ser. No. 351,579

Claims priority, application Austria, Feb. 26, 1981, 887/81

Int. Cl.³ A63C 9/00

U.S. Cl. 280—614 **18 Claims**



10. A safety ski binding for releasably holding on a ski a ski shoe having a sole with a bottom surface which curves upwardly at a front end thereof, comprising a plate adapted to extend along an upper surface of the ski and to be secured to the ski at a front end thereof, a sole holder having hold-down means adapted to engage an upper side of the ski shoe sole at the front end thereof, means supporting said sole holder on said front end of said plate for movement in a manner effecting approximately vertical movement of said hold-down means, and operating means coupled to said sole holder and responsive to movement of the ski shoe sole which causes downward movement of the front end thereof for moving said sole holder in a manner which effects downward movement of said hold-down means relative to said plate, thereby maintaining said hold-down means in secure engagement with the upper surface of the ski shoe sole.

4,468,049

SAFETY SKI BINDING PROVIDED WITH AN ELECTRONIC DEVICE FOR DISPLAYING THE DEGREE OF STIFFNESS OF SKI-BOOT RELEASE

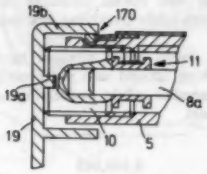
Daniel le Faou, Varennes Vauzelles, and Henry Menager, Nevers, both of France, assignors to Ste Look, Nevers, France

Filed Aug. 5, 1982, Ser. No. 405,600

Claims priority, application France, Aug. 6, 1981, 81 15268

Int. Cl.³ A63C 9/08

U.S. Cl. 280—634 **3 Claims**



1. A safety ski binding comprising at least one ski-boot retaining member controlled by a resilient member having an adjustable degree of stiffness, wherein:

said ski binding comprises a force transducer adapted to detect the effort exerted by said resilient member on said retaining member and to deliver a signal which is a function of the effort detected to an electronic display device,

the display device having a normally-open supply circuit which comprises a switch which is accessible from the exterior of the ski binding and can be actuated so as to supply current to said display device,

said switch being so arranged as to be automatically actuated as a result of positioning of a tool of suitable shape which serves to adjust the stiffness of the resilient member.

4,468,050

COMPUTER OPTIMIZED ADAPTIVE SUSPENSION SYSTEM

Lonnie K. Woods, 2222 Lindsay Michelle, Alpine, Calif. 92701, and James M. Hamilton, 22 Clover, Irvine, Calif. 92714

Filed Aug. 15, 1983, Ser. No. 523,279

Int. Cl.³ B60G 11/26

U.S. Cl. 280—707 **19 Claims**

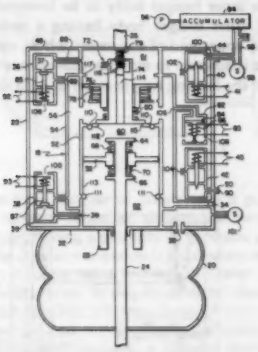
1. A vehicle suspension control system in communication with a plurality of suspension units connected between the chassis and axle portions of a vehicle, each suspension unit including spring means and a damping device, the compression and rebounding damping forces of each said damping device being selectively and independently adjustable substantially independently of suspension movement velocity, each said suspension unit having sensor means to determine the position of said axle with respect to said chassis, said control system comprising:

means providing a first signal from each said sensor means, said first signal representing the position of said axle with respect to said chassis for each said suspension unit;

first signal processing means for generating a plurality of groups of a plurality of second signals in response to said first signals from said sensor means, each said second signal in each group representing a distinct state of motion of said chassis and axle with respect to the desired response for the associated damping device, each said group of second signals being peculiar to each said suspension unit;

second signal processing means for generating a plurality of groups of a plurality of paired third and fourth signals, each pair of said third and fourth signals being generated in response to one of said second signals, each said third and fourth signal representing the desired compression and rebound damping forces respectively relating to said distinct state of motion, each said group of third and fourth signals being associated with a respective one of said damping devices;

third signal processing means for generating a plurality of paired fifth and sixth signals, each said pair of fifth and sixth signals being in response to one of said groups of third and fourth signals, each said pair of fifth and sixth signals being associated with a respective one of said damping devices, said fifth signal comprising a summation



of said third signals associated with said damping device, said sixth signal comprising a summation of said fourth signals associated with said damping device;

means for adjusting the compression damping forces of each said damping device;

means for adjusting the rebound damping forces of each said damping device;

means for applying one of said fifth signals to said compression damping force adjusting means; and

means for applying one of said sixth signals to said rebound damping force adjusting means;

whereby the compression and rebound damping forces are continually optimally controlled for each said damping device to provide desired ride characteristics for the vehicle.

4,468,051

MOTOR VEHICLE

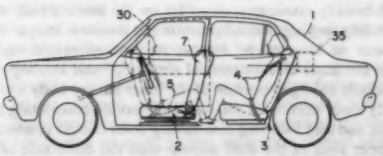
Heitaro Kobayashi, 14-11, Sangen-Cho, Choshi-Shi, Chiba-Ken, Japan

Filed Aug. 16, 1982, Ser. No. 408,562

Claims priority, application Japan, Nov. 9, 1981, 56-166684[U]; Jan. 20, 1982, 57-5016[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—751 **11 Claims**



1. A motor vehicle having a plurality of front seats each with a back rest, rear seats and dashboard means in front of the front seats, said vehicle comprising:

means for mounting at least one of the front seats in a manner turnable rearwardly to confront one of the rear seats; cushioning means bulging rearwardly from the upper part of the back rest of the rearwardly turnable front seat; and shock-absorbing means disposed in the dashboard means at such a position closely confronting said cushioning means when the rearwardly turnable front seat is turned rearwardly, said shock-absorbing means comprising a cushioning body accommodating therein coil springs the axial centerlines of which are in substantial alignment with the direction of the load to be exerted to the shock-absorbing means as a result of collision of said cushioning means against the dashboard means with the rearwardly turnable front seat turned rearwardly.

4,468,052

AUTOMOTIVE VEHICLE BODY STRUCTURE

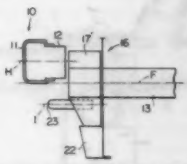
Kiyoshi Koike, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 18, 1982, Ser. No. 340,019

Claims priority, application Japan, Jan. 21, 1981, 56-6838[U]

Int. Cl.³ B62D *21/00*

U.S. Cl. 280—784 **2 Claims**



1. An automotive vehicle body structure having a fore-and-aft direction and provided with at least one bumper assembly extending laterally of the automotive vehicle body structure, comprising:

a side member horizontally extending in said fore-and-aft direction and having a vertically intermediate horizontal plane, said bumper assembly being disposed above the horizontal plane,

a rigid vertically disposed connecting member structurally intervening between and interconnecting said bumper assembly and said side member, and

a hook member connected directly to and projecting from said connecting member in said fore-and-aft direction and located below said horizontal plane, the hook member terminating in a position located inwardly of a front end of said bumper assembly.

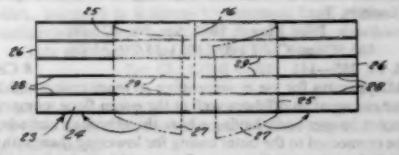
4,468,053

INSERTED LABELS - ADDRESS BOOK

Velma L. Bradley, 503 2nd St., Naches, Wash. 98937

Filed Apr. 26, 1982, Ser. No. 371,567

Int. Cl.³ B42D *1/08*

U.S. Cl. 281—31 **2 Claims**

1. An inserted labels address book, comprising in combination, a foldable address book and a plurality of address labels

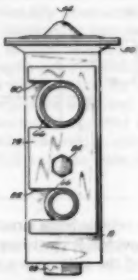
for insertion into said address book, said address book comprising a single elongated flat cover sheet having a left and right cover portion foldable about a center fold line, a page sheet of transparent material respectively overlaying each of said left and right cover portions, loop pile fastener material formed at the periphery of said left and right cover portions and said page sheets to peripherally retain the page sheet to its respective cover portion, and spaced apart elongated strips of loop pile fastener material formed between said page sheets and their respective cover portions, extending from a respective left and right side edge perpendicularly toward said center fold line to retain the page sheets to the cover portions along said elongated strips, and defining pockets between adjacent strips of loop pile fastener material which pockets have access openings facing said fold line, said pockets receiving said address labels, and wherein said page sheets are removable from their respective cover portions for cleaning out said pockets.

4,468,054

FLANGE MOUNTED THERMOSTATIC EXPANSION VALVE

Charles D. Orth, Lake Forest, Ill., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 3, 1982, Ser. No. 438,802
Int. Cl.³ F16L *39/00, 41/00*
U.S. Cl. 285—137 R **1 Claim**



1. A valve having a body including a plurality of ports each having a seat area surrounding a section leading to a bore,

a plurality of tubes each having an end fitting snugly in a respective bore,

each of said tubes having an upset spaced from said end and seated on said seat area,

a plurality of O-rings each between a respective end and a respective upset of a respective tube and engaging a respective section of a respective bore,

a plate having a plurality of notches each fitting over a respective tube and engaging a respective upset, all of said notches opening on the same edge of said plate and extending inwardly from said edge in parallel alignment, and

a screw holding the plate on said body to retain said plurality of tubes.

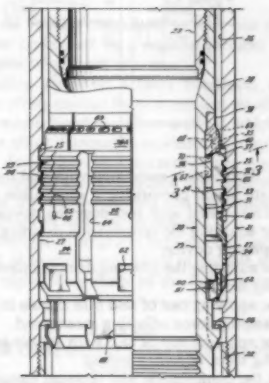
4,468,055

WELLHEAD APPARATUS

Larry E. Reimert, Houston, Tex., assignor to Dril Quip, Inc., Houston, Tex.

Filed May 3, 1982, Ser. No. 373,691
Int. Cl.³ F16L *21/00, 55/00, 21/06*
U.S. Cl. 285—141 **8 Claims**

1. Apparatus for use in suspending an inner casing within an outer casing of an offshore well at the ocean floor, comprising an outer hanger body having a bore therethrough and adapted to be connected to the outer casing for lowering therewith into a landed position at the ocean floor, said bore having at least one upwardly facing seating surface thereabout, an inner hanger body including a tubular body adapted to be connected to the inner casing for lowering therewith into the outer hanger body, and having a recess thereabout, a circumferentially split landing ring having at least one downwardly facing landing surface thereabout and arranged about the inner hanger body for expansion and contraction within the recess between a position in which it is free to pass into the bore of the outer hanger body for disposal opposite the seating surface and an expanded position in which the landing surface thereabout is landed on said seating surface, said landing ring being of such construction that it will tend to assume its expanded position, means for retaining the landing ring against upward movement with respect to the inner hanger body as the landing ring expands and contracts within said recess, said retaining means being releasable, when the landing ring is landed on the outer hanger body and the weight of the inner casing is slacked off, to permit the inner hanger body to be lowered with respect thereto, said inner hanger body having a radially enlarged, portion at the upper end of the recess whose outer circumferential surface is adapted to move within an inner circumferential surface of the landing ring in order to hold the landing ring



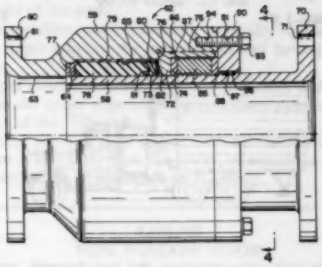
in landed positions, as the inner hanger body is so lowered, and a groove thereabout above the radially enlarged portion, and a load ring carried within the groove with the radially inner portion of its lower end supported on the lower end of the groove, and a substantially circumferentially continuous shoulder on its upper end facing a substantially circumferentially continuous shoulder on the upper end of the groove for abutment therewith, the radially outer portion of the lower end of the load ring having a substantially circumferentially continuous shoulder adapted to be supported on a substantially circumferentially continuous shoulder on the landing ring when the landing ring is in landed position and the inner hanger body has been so lowered to dispose its circumferential surface within the inner circumferential surface of said landing ring, the radially enlarged portion of the inner hanger body and the radially inner portion of the load ring having connecting slots therein, and said load ring also having ports therein connecting the upper ends of the slots therein with the outer side of the load ring, whereby well fluid may circulate through the annular space between the inner hanger body and bore of the outer hanger body.

4,468,056

SWIVEL

James H. Kramer, Akron; Roy L. Orndorff, Jr., Kent, both of Ohio; James M. Stephens, Grandview, Mo., and Vincent T. Presutto, Barberton, Ohio, assignors to The B. F. Goodrich Company, N.Y.

Filed Oct. 5, 1981, Ser. No. 308,865
Int. Cl.³ F16L *27/00*
U.S. Cl. 285—281 **4 Claims**



1. A swivel joint for use in connecting a pair of axially spaced risers that are subjected to torsional twisting forces, each of said risers having a plurality of conduits, swivel means interconnecting conduits in one riser to conduits in an adjacent riser, said swivel means being located off-center of said risers, each of said swivel means having an outer tubular member and an inner tubular member, the inner bore of said outer tubular member having at least a pair of stepped bores defining an annular shoulder therebetween, a flanged sleeve abuttingly contacting said annular shoulder, one of said stepped bores cooperative with one end of said inner tubular member and said sleeve to define a first chamber, the inner periphery of said one stepped bore of said outer tubular member has an annular ring bonded thereto, said annular ring being made of an anti-friction material, said one end of said inner tubular member having a pair of axially spaced annular bearings, an annular sealing member of elastically deformable material in compression having an inner face bonded to the outer periphery adjacent to said one end of said inner tubular member and having an outer surface frictionally engaging said annular ring for relative rotation therebetween, said annular sealing member operative under load to contact said pair of spaced annular bearings, trust bearing means mounted on the other end of said inner tubular member, a retainer mounted on one end of said outer tubular member and abuttingly contacting said thrust bearing means on said inner tubular member, and said thrust bearing means is captively held in an axial direction by said flanged sleeve and said retainer on said inner tubular member.

4,468,057

PIPE COUPLING SYSTEM

Alain de Crombrugghe, 44 St. Alexandre, Limbour-Gatineau, Québec, Canada (J8V 1B4)

Continuation of Ser. No. 124,329, Mar. 31, 1980, abandoned. This application Nov. 26, 1982, Ser. No. 444,859
Int. Cl.³ F16L *21/06*
U.S. Cl. 285—373 **7 Claims**

1. A pipe coupling apparatus, comprising, in combination:

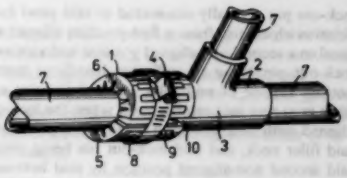
a unitary pipe coupling member having:

a cylindrical tubular body portion adapted to concentrically straddle a joint between a pipe and a pipe fitting in spaced relation thereto, said body portion having a pair of opposed longitudinal edges and being transversely elastically deformable so as to permit separation of said edges for positioning of said body portion over a pipe joint, a first plurality of elongated, longitudinally extending openings circumferentially spaced about said body portion adjacent one end thereof and a second plurality of elongated, longitudinally extending openings circumferentially spaced about said body portion adjacent the other end of said body portion;

first flange means extending radially inwardly from said one end of said body portion, said first flange means defining an aperture sized to loosely receive the peripheral surface of a pipe in an uncompressed condition of said body portion and abuttingly engage said surface of said pipe in a compressed condition of said body portion for maintaining said one end of said body portion in substantially concentric relation with said pipe;

second flange means extending radially inwardly from the other end of said body portion and having an aperture sized to loosely receive the peripheral surface of a pipe fitting disposed within said body portion in an uncompressed condition of said body portion and abuttingly engage said peripheral surface of said pipe fitting in a compressed condition of said body portion for maintaining said other end of said body portion in substantially concentric relation with said pipe fitting;

a first plurality of lug members, each said lug member extending from the outer end of one of said openings of said first plurality of openings and extending inwardly of said body portion at an acute angle thereto toward said other end of said body portion, each said lug member having a free end engageable with a peripheral groove formed in the outer surface of a pipe disposed within said body portion in said compressed condition of said body portion for resisting axial outward movement of said pipe from said one end of said body portion;



a second plurality of spaced lug members, each said lug of said second plurality of spaced lug members extending from the outer end of one of said openings of said second plurality of openings and extending inwardly of said body portion at an acute angle thereto toward said one end of said body portion, each said lug of said second plurality of lugs having a free end engageable with a peripheral groove formed in the outer surface of a pipe fitting disposed within said body portion in said compressed condition of said body portion for resisting axial outward movement of said fitting through said other end of said body portion; and

clamp means for radially inwardly compressing said body portion.

4,468,058

LOCKING FUEL CAP

Darl E. Haagen, Fremont, Ind., and David L. Eyre, Coldwater, Mich., assignors to Kuhlman Corporation, Troy, Mich.

Continuation of Ser. No. 255,233, Apr. 17, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,663
Int. Cl.³ E05B *47/00*
U.S. Cl. 292—144 **10 Claims**

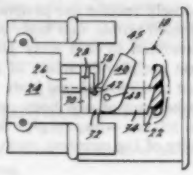
1. A fuel cap locking device for a vehicle having a fuel tank and a filler neck associated therewith for adding fuel to said tank, comprising:

a filler cap for threadedly engaging onto the open end of the filler neck of the fuel tank and having a plurality of ratchet

teeth formed on the underside thereof in an annular ring recessed relative to the bottom surface of the filler cap;

an electrical solenoid disposed adjacent the end of said filler neck and having a spring-biased armature which projects outwardly from the solenoid when the solenoid is not energized and is retracted into the solenoid when the solenoid is energized;

a pawl for engaging said ratchet teeth to prevent rotation of said filler cap in a counterclockwise direction, said pawl being connected to said armature for movement therewith such that when said solenoid is energized the pawl is withdrawn and disengaged from the ratchet teeth of said filler cap;



a lock-out pin pivotally connected to said pawl for pivotal rotation clockwise from a first position aligned with said pawl to a second non-aligned position and vice versa, said lock-out pin being of sufficient length to contact said bottom surface of said filler cap and prevent said pawl from engaging said ratchet teeth when the lock-out pin is aligned with said pawl and said filler cap is installed on said filler neck, and said lock-out pin being pivotable to said second non-aligned position by said bottom surface when said filler cap is rotated clockwise as it is re-installed onto the filler neck; and

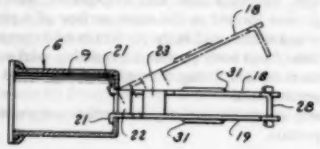
cam means for rotating said lock-out pin from said second non-aligned position to said first aligned position when said solenoid is energized and said pawl is withdrawn as said armature is retracted into said solenoid.

4,468,059

BOLT UNIT FOR A LOCKSET

Kenneth R. Nelson, West Vancouver, Canada, and James R. Allison, San Francisco, Calif., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Jan. 11, 1982, Ser. No. 338,411
Int. Cl.³ E05C *13/00*
U.S. Cl. 292—337 **7 Claims**



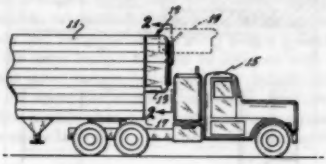
1. A changeable backset bolt unit comprising a housing having a side wall and having an end wall with an opening in said end wall, said opening having side edges spaced apart to leave side portions of said end wall, a pair of side plates, means on said side plates for releasably holding said side plates in position relative to each other, angle hooks on said side plates at one end thereof parallel to said end wall and adapted to pass through said opening and engage the inner face of said side portions of said end wall, means on each of said side plates adapted to abut the other side plate when said side plates contact said side edges, and means on each of said side plates adapted to contact the outer face of said end wall when said angle hooks engage the inner face of said side portions of said end wall.

4,468,060

AERODYNAMIC ENCLOSURE WITH A CONDENSER INLET COVER

Joseph M. FitzGerald, 8690 Los Coyotes Dr., Buena Park, Calif. 90621, and James P. FitzGerald, 1845 Island Dr., Fullerton, Calif. 92633

Filed Sep. 29, 1982, Ser. No. 427,780
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S **8 Claims**



1. An apparatus for reducing the aerodynamic drag of a refrigerated cargo carrying vehicle of the type having a front wall and a refrigeration unit on the front wall, said refrigeration unit having a condenser, said apparatus comprising:

a wind deflector for at least partially enclosing the refrigeration unit and the condenser and configured to reduce the aerodynamic drag of the vehicle;

said wind deflector having a forward wall, said forward wall having an air intake opening therein for the passage of air to the refrigeration unit, said opening being adapted to confront the condenser of said refrigeration unit when the wind deflector is mounted on the vehicle to reduce the aerodynamic drag of the vehicle;

a closure member;

means for mounting said closure member on the wind deflector for movement between first and second positions, said closure member closing more of said opening in said first position than in said second position;

said closure member comprsing a door and said mounting means mounts the door for sliding movement between said first and second positions; and

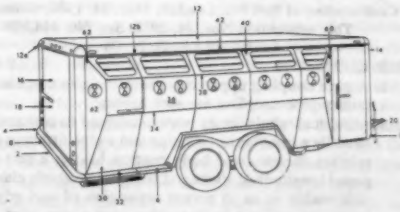
said mounting means including at least one guide rod mounted on the wind deflector and extending generally along one side of said opening and bearing means for mounting the door on said guide rod for movement between said first and second positions.

4,468,061

HORSE VAN

Dale E. Blake, P.O. Box 57, Star, Id. 83639

Filed May 18, 1982, Ser. No. 379,501
Int. Cl.³ B60P *3/04*
U.S. Cl. 296—24 C **1 Claim**



1. A wheeled van for carrying standing live animals such as

horses which are positioned transversely of the van, comprising

a body comprising a floor and a roof having side edges, end walls and side walls,

each side wall being constructed to provide a transverse section of increased interior width at the level of the head and rump of a standing horse within the van and

a lower panel extending longitudinally of the body with its lower edge at the side edge of the floor and extending angularly outwardly and upwardly from its lower edge with its upper edge approximately at the midpoint of the height of the body,

an intermediate panel extending vertically upwardly from the upper edge of the lower panel and having an upper edge,

an upper panel extending angularly upwardly and inwardly from the upper edge of the intermediate panel to the side edge of the roof, and

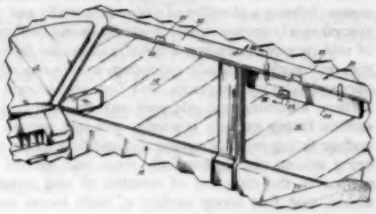
a vertical panel at each end of each side of the van which extends angularly from the lower, intermediate and upper panels to the adjacent end of the body.

4,468,062

SIDE WINDOW VISOR

Konrad H. Marcus, and Dennis J. Fleming, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Jun. 25, 1982, Ser. No. 392,240
Int. Cl.³ B60J 3/02
U.S. Cl. 296—97 G **10 Claims**



1. A visor assembly for a vehicle comprising:

a visor panel;

at least a pair of substantially parallel arms having a length less than the height of said visor panel, said arms spaced from one another and each having an end pivotally secured to said visor panel at spaced locations thereon;

means for pivotally securing the opposite end of each arm to a vehicle to permit pivotal movement of said visor panel on said arms in a plane generally orthogonal to the pivot axes of said arms and parallel with said arms between a raised stored position and a lowered use position through a distance less than the height of said visor panel; and

cover means concealing said visor panel and said arms when in a stored position.

4,468,063

DRIVE MECHANISM FOR A VEHICLE SUNROOF

Kazuyoshi Yukimoto, Kariya; Keiji Mori, Toyota, and Mitsuyoshi Masuda, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Aug. 12, 1982, Ser. No. 407,626
Claims priority, application Japan, Aug. 13, 1981, 56-127289
Int. Cl.³ B60J 7/04
U.S. Cl. 296—223 **24 Claims**

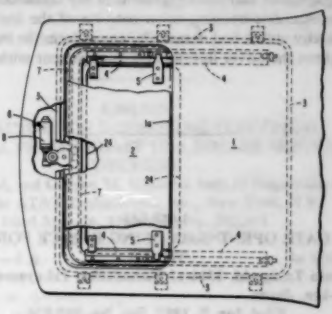
1. A drive mechanism for a vehicle sunroof having a movable roof panel, the drive mechanism comprising:

a motor;

a rotatable drive shaft operatively coupled to and driven by said motor;

transmission means connected to said drive shaft, and adapted to be operatively coupled to said movable roof panel, for transmitting motive power from said drive shaft to said roof panel;

a rotatable indicating member having on its periphery two cam grooves which are circumferentially and axially offset from one another, a portion of each of said cam grooves corresponding to a limit of movement of said roof panel;



reduction gear means interconnecting said drive shaft and said indicating member for effecting rotary movement of said indicating member at a reduced rate; and

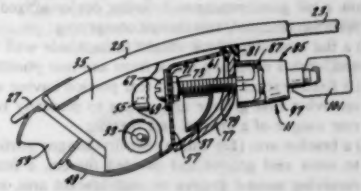
switch means operatively coupled to said cam grooves for sensing the position of said cam grooves and shutting off said motor when said roof panel reaches either of its limits of movement.

4,468,064

ANTI-THEFT MECHANISM FOR REMOVABLE AUTOMOBILE ROOF PANEL

Luther J. McAdams, Sr., 612 E. 75th St., Chicago, Ill. 60619

Continuation-in-part of Ser. No. 277,067, Jun. 25, 1981, abandoned. This application Apr. 19, 1982, Ser. No. 369,626
The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.
Int. Cl.³ B60J 7/18
U.S. Cl. 296—224 **2 Claims**



1. An anti-theft mechanism for a handle operated latching mechanism of a removable automobile roof panel of the type in which the handle is located in a recessed well in the panel trim molding, an opening leads into the well, and the handle pivots to latch and unlatch the panel, the mechanism including:

a base having a bottom wall and a back wall, which walls engage and conform to the bottom and back walls respectively of the panel trim molding well,

means to attach the base to the panel trim molding,

a threaded opening in the base aligned with an opening in the panel trim molding,

a cover having a top wall and a front wall, which walls are formed to engage the back and bottom walls of the base and to be generally flush with the surface of the panel trim molding surrounding the well opening,

an opening in the cover,

a tubular lock housing extending through the opening in the cover and fastened thereto, and

a key operated lock plug located in the lock housing and having a threaded rod which is engageable with the threaded opening in the base,

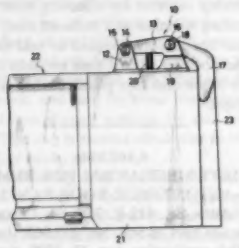
the lock plug being rotatable relative to the lock housing only when a key is inserted in the lock plug to permit engagement and disengagement of the threaded rod with the threaded opening upon rotation of the lock plug to thereby attach and detach the cover from the base and to tighten the cover into locking engagement with the base.

4,468,065

TAIL GATE OPENING/CLOSING DEVICE FOR DUMP TRUCK

Katsuyuki Taniguchi, 1511-11 Yamadacho, Takayama-shi Gifu, Gifu-ken, Japan

Filed Jun. 7, 1982, Ser. No. 385,524
Int. Cl.³ B60P *1/28*
U.S. Cl. 298—23 R **5 Claims**



1. In a dump truck with a rear carrier section, said dump truck having a pair of parallel vertical side walls each with a top rear end, and a tail gate at the rear end of said rear carrier section, a tail gate opening and closing device affixed to each side wall top rear end, said device comprising:

(a) a flat mounting block affixed to each side wall top rear end, with a mounting block front and rear portion;

(b) a fixed bracket (12) at said rear portion having an upper receiving first groove and means to pivotally receive a rear tongue of a bracket arm therein;

(c) a bracket arm (13) with a rear first tongue portion sized to enter said groove and pivoted therein, a front open receiving second groove on said bracket arm, means to hold a second tongue therein pivotally, and a flat bottom part on said bracket arm;

(d) a tail gate arm (17) with a rear second tongue sized to enter and pivot in said second groove, said tail gate arm having a bent elbow with a front forearm which can extend vertically downward and is fastened to the tail gate; and,

(e) a flat part on said mounting block rear portion disposed for receiving thereon the flat bottom part on said bracket arm,

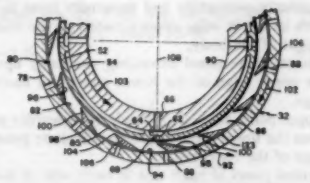
whereby, when said dump truck rear section is tilted backwards, the tail gate will swing and tend to remain vertical allowing the material in the dump truck to be dumped, the bracket arm and flat bottom part will leave the flat part on said mounting block, and, when the dump truck rear carrier section is tilted forward, the bracket arm flat bottom part will again come to rest on the flat part on said mounting block.

4,468,066

OIL CAPTURE SCOOP

Jorge A. Alcorta, Hobe Sound, and Robert J. Kildea, Juno Isles, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1983, Ser. No. 490,700
Int. Cl.³ F16C *33/66*
U.S. Cl. 308—187 **4 Claims**



1. A shaft assembly comprising:

first hollow shaft means rotatable about an axis and having an inner surface and an outwardly facing surface;

second shaft means adapted to rotate about said axis in a direction counter to the direction of rotation of said first shaft means and including a shaft portion surrounding said first shaft means, said shaft portion having a radially inwardly facing surface spaced radially outwardly from said outwardly facing surface defining an axially extending annulus therebetween, said shaft portion including wall means defining a plurality of circumferentially and closely spaced apart recesses in said inwardly facing surface, each of said recesses including a radially inwardly facing bottom wall surface, radially extending, axially spaced apart, opposed side wall surfaces, and first and second scoop surfaces adjoining said side wall surfaces, said first scoop surface facing radially inwardly and said second scoop surface facing radially outwardly, said first scoop surface being spaced circumferentially from said second scoop surface in the direction of rotation of said outer shaft means, said first scoop surface of each recess and said second scoop surface of the recess adjacent thereto substantially intersecting along a line parallel to said axis defining a wedge;

said inner shaft means having a plurality of oil passageways extending from said inner surface to said outwardly facing surface, said oil passageways having outlets in the same axial plane as said recesses for directing oil from said oil passageways, across said second annulus, into said recesses; and

means defining second passageways through said second shaft means in fluid communication with said recesses for carrying oil from said recesses through said second shaft means.

4,468,067

DISPLAY CASE WITH A HOOK LOCKING MECHANISM

Claire L. Jenkins, De Forest, Wis., assignor to Rock Leasing, Inc., Longmont, Colo.

Filed Aug. 11, 1982, Ser. No. 407,068
Int. Cl.³ F16B *12/44*
U.S. Cl. 312—140 **11 Claims**

1. A display case with a locking mechanism for securing display case components together comprising

an elongated member with a side, said elongated member including a pair of opposite, spaced apart, inwardly facing hooks attached to said side and extending generally the length thereof,

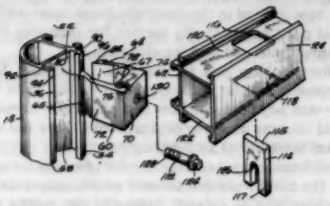
an elongated hollow member with an end and opposed sides, each of said sides including an opening therein spaced away from said end of said hollow member,

a locking member in said openings,

a hook member inside said end of said hollow member, said

hook member having an end and said end of said hook member including a pair of opposite, spaced apart, outwardly facing hooks, extending beyond said end of said hollow member, with said hook member's hooks adapted to interlock with said elongated member's hooks, and

biasing means inside said hollow member and releasably connected to said locking member and said hook member



and extending the whole length between said locking member and said hook member for drawing said hook member's hooks toward said end of said hollow member, and into engagement with said elongated member's hooks, so that said hook member's hooks and said elongated member's hooks interlock and said elongated member's hooks are clamped between said hook member's hooks and said end of said hollow member.

4,468,068

AUTOMATIC MONEY DEPOSITING AND DISBURSING MACHINE PROVIDED WITH SLIDINGLY MOVABLE FRAME FOR SUPPORTING STACKER BOX

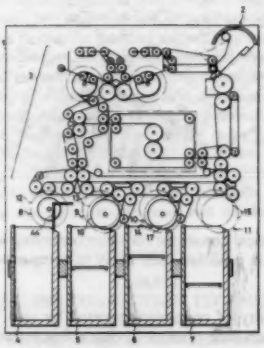
Eiichi Kokubo; Koichi Goi; Junichi Arikawa; Hideyuki Ebihara, and Hiroshi Chiba, all of Tokyo, Japan, assignors to Laurel Bank Machine Co. Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,999

Claims priority, application Japan, Feb. 4, 1982, 57-16597

Int. Cl.³ A47B *88/00*; F05B *65/46*

U.S. Cl. 312—333 **1 Claim**



1. In an automatic money depositing and disbursing machine comprising a machine body, and a slidably movable frame adapted to be pushed in and pulled out of said machine body, said slidably movable frame supporting thereon at least one stacker box having an upper opening through which bank notes are stacked and dispensed, an improvement which comprises, in combination:

(1) said machine body including a positioning block for positioning said slidably movable frame pushed therein at a pre-set location and a limit release lug; and

(2) said slidably movable frame including a stacker box support frame swingably mounted to said slidably movable frame for supporting said stacker box to be swung between the upper and lower positions, a movement limit shaft on said slidably movable frame and biased by a spring to be held normally at a retracted position and released from the biasing action of said spring to project to be engaged by said positioning block when said stacker support frame is swung to the upper position, and a swing limit plate means on said slidably movable frame for abutting against said limit release lug of said machine body to permit said stacker support frame to swing upwardly when said slidably movable frame is pushed to a position approximate to said pre-set location.

4,468,069

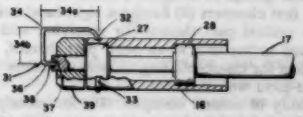
CONTACTOR FOR IMPRESSING ELECTRICAL POTENTIAL FROM A SHAFT TO A ROLLER MOUNTED THEREON

John R. Meal, and Gordon M. Wiklund, both of Naperville, Ill., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 26, 1982, Ser. No. 382,274

Int. Cl.³ H01R *39/00*

U.S. Cl. 339—6 A **14 Claims**



1. A contactor for establishing a conductive path from a shaft to a roller mounted on the shaft, which comprises:

a first contact section having a surface contacting and engulfing the periphery of the roller;

a second contact section having a free end engaging and axially aligned with the center of the shaft; and

a third conductive intervening section interconnecting the first and second contact sections.

4,468,070

SWIVELING APPARATUS HAVING INSTALLED ELECTRIC CABLES

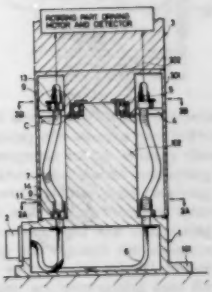
Hirotoshi Yasuoka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,866

Claims priority, application Japan, Feb. 2, 1982, 57/13145[U]

Int. Cl.³ H01R *39/00*

U.S. Cl. 339—7 **9 Claims**



1. A swiveling apparatus having installed electric cables (6), comprising:

a fixed part (1) including a base portion (101) secured to a floor and a cylindrical portion (102) having a cross-sec-

tional configuration smaller than that of the base portion, said cylindrical portion projecting upward from a center of the base portion;

an electric connector (2) secured to said base portion of said fixed part for connecting incoming electric cables originating from outside equipment;

a bearing (5) provided at an upper end of said cylindrical portion of said fixed part;

a rotating part (3) for supporting further equipment on an upper part thereof, said rotating part including a rotating portion (302) which is supported rotatably by said bearing, and a side wall portion (301) connected to said rotating portion so as to surround said cylindrical portion with a gap of a predetermined distance maintained between said side wall portion and said cylindrical portion;

a plurality of ribs (4) provided internally of said side wall portion of said rotating part;

right-hand wound springs (7) and left-hand wound springs (8) alternately disposed along a periphery of said cylindrical portion to extend between said ribs and said base portion of said fixed part, said right-hand and left-hand wound springs being of sufficient lengths for rotating said rotating part (3) through a predetermined angle;

a plurality of first clampers (9) for securing said right-hand wound springs to said base portion and said ribs, each of said first clampers (9) having a right-hand helical groove at a central part thereof for receiving said right-hand wound spring and, at an outer part thereof, a clamping portion for clamp-holding an outer diameter part of said right-hand wound spring;

a plurality of second clampers (10) for securing said left-hand wound springs to said base portion and said ribs, each of said second clampers having a left-hand helical groove at a central part thereof adapted for receiving said left-hand wound spring and, at an outer part thereof, a clamping portion for clamp-holding an outer diameter part of said left-hand wound spring; and

a plurality of electric cables (6) installed between said connector (2) and said equipment supported by said rotating part so as to pass through an interior of said right-hand wound springs and said left-hand wound springs.

4,468,071

DOUBLE LATCH SNAP LOCK BASE FOR ANNULAR FLUORESCENT LAMPS

Irving Bradley, Russell Township, Cuyahoga County, and Gerald W. Povall, Highland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 235,687, Feb. 18, 1981, abandoned. This application Feb. 24, 1983, Ser. No. 469,340

Int. Cl.³ H01R *33/08*

U.S. Cl. 339—50 C **6 Claims**

1. An improved base for an annular lamp comprising:

(a) a pair of mating parts having a semicylindrical shape, said parts containing a pair of centrally located channel and leg elements having fitted cross sections formed on the interior thereof and spaced from the semicylindrical surfaces,

(b) both of said leg elements comprising latching means and both of said channel elements receiving said leg elements for engaging said latching means so that physical clearances remain between all mating surfaces of said channel and leg elements producing an unstressed condition thereof after assembly together of said parts, each of said channels communicating through the semicylindrical wall in one of said mating parts to form apertures for disengaging both leg elements after assembly,

(c) a boss formed in the semicylindrical outer wall of one of said parts and centrally located for receiving conductive contact pins and said leg elements,

(d) four locking pins for insertion in recesses located on opposing contact surfaces of said mating parts which are located adjacent said boss and physically cooperate with said latching means to help prevent flexure and unlatching after assembly of said mating parts,

(e) reinforcing means on the interior of said parts and located at the middle portion thereof which cooperate with said locking pins to prevent flexure of the mating parts, said reinforcing means comprising semicircular discs orthogonal to said semicylindrical surfaces and connecting said boss to the inner surface of said one part and attached to the interior of the other part, and

(f) lug elements located at the ends of both semicylindrical walls of said mating parts which enter a circumferential recess located at one end of the lamp and further said lamp including a pair of glass nodules located in said recess to limit rotation of the assembled base about said lamp while still retaining said unstressed condition.

4,468,072

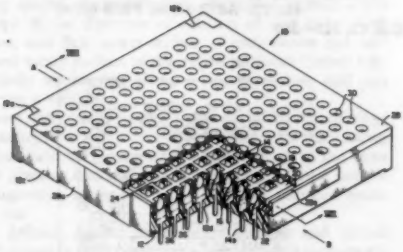
MULTI-PIN ZERO INSERTION FORCE CONNECTOR

Amir-Akbar Sadigh-Behzadi, Van Nuys, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 17, 1981, Ser. No. 331,665

Int. Cl.³ H01R *13/62*

U.S. Cl. 339—74 R **14 Claims**



1. An electrical connector for interconnecting a plurality of terminal pins in predetermined array to companion apparatus, comprising:

(a) a base;

(b) a plurality of contacts supported by said base in said array, each such contact having a first terminal for connection to said companion apparatus and a second terminal adapted for receiving one such terminal pin and having facing elements biased into preselected attitude for electrically engaging said terminal pin; and

(c) first and second cam means defining first and second plate members supported in said connector for movement responsive to operator input in respective opposite first and second senses, said first and second plate members including openings therethrough for passage of said facing elements of said contacts, plate member surfaces bounding said openings being engageable with said contacts for displacing same from such biased attitude to facilitate low force insertion of said terminal pins therein upon move-

ment of said first and second cam means, said first and second cam means defining respective first and second surfaces accessible exteriorly of said base for receipt of said operator input, said first and second plate members further including respective first and second plate sections each having a tab extending endwise orthogonally thereof, such tabs extending directionally oppositely of one another in said connector and defining respective abutments for the plate sections in the course of said movements of said first and second cam means, exterior surfaces of said tabs defining said cam means first and second surfaces.

4,468,073

ZERO INSERTION FORCE CONNECTOR

Stephen A. Machcinski, Winthrop, Mass., assignor to Precision Connector Designs, Inc., Winchester, Mass.

Filed Mar. 21, 1983, Ser. No. 477,157
Int. Cl.³ H01R 9/09
U.S. Cl. 339—74 R **8 Claims**

1. A connector for making electrical connection with a plurality of first contacts arranged at predetermined positions on a component, said connector comprising

a housing having a cavity for receiving said contacts,

a plurality of second contacts secured at secured portions to said housing, said contacts being resilient, having free ends movable within said cavity in a first direction against the contact surfaces of said first contacts, having bends between said free ends and said secured portions at positions adjacent to interior housing sidewall surfaces, and having inclined contact portions between said free ends and said secured portions and being inclined relative to a second direction at an angle to said first direction, and

cam means for pushing in said second direction against said inclined contact portions to cause them to move in said first direction, initially moving the entire free lengths of said contacts between said secured portions and said free ends until said bends touch said sidewalls, and thereafter moving the portions between said bends and said free ends.

4,468,074

SOLDERLESS CONNECTION TECHNIQUE AND APPARATUS

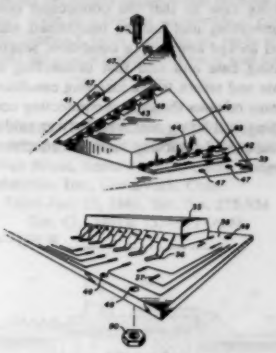
Herman B. Gordon, Tempe, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 907,958, May 22, 1978, abandoned. This application Apr. 30, 1979, Ser. No. 34,001
Int. Cl.³ H01R 23/72
U.S. Cl. 339—75 N **4 Claims**

1. A solderless connector for establishing and maintaining electrical contact between the terminal portions of a plurality of leads extending outwardly from at least a first electrical circuit component and a plurality of conductors, said connector comprising:

a housing, said housing defining a pair of oppositely disposed planar surfaces, said housing further defining a component receiving recess, said housing additionally having a plurality of lead receiving guide slots in said one of said surfaces, said guide slots extending outwardly from said recess;

a planar non-conductive substrate, said substrate supporting plural conductors on a first face thereof, at least some of said conductors terminating at exposed contact portions arranged in a pattern commensurate with the pattern of component lead terminal portions contact portions of said



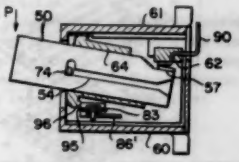
substrate supported conductors by said resilient sheet, wherein said housing is further provided with at least a first longitudinal groove formed in said one of said planar surfaces, said recess and said groove being in communication via said guide slots, the leads from a comporent disposed in said housing recess extending through said slots and terminating in said groove, said resilient member being disposed within said groove.

4,468,075

STRUCTURE OF ELECTRICAL CONNECTING DEVICE

Masayoshi Tamura; Ryohei Kinoshita, both of Suzaka; Norio Matsubayashi, Nagano; Mitsuharu Matsumoto, Kawasaki; Toshiaki Sukeda, and Osamu Hirakawa, both of Suzaka, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 27, 1981, Ser. No. 286,864
Claims priority, application Japan, Jul. 28, 1980, 55-103456
Int. Cl.³ H01R 13/629, 13/639
U.S. Cl. 339—75 M **10 Claims**



1. An electrical connecting device comprising a first connecting unit consisting of a cassette type bubble memory having a case and a magnetic bubble memory element accommodated within the case and a second connecting unit having an accommodating port for insertingly receiving said first connecting unit, both units having electrical terminals connected electrically by inserting said first connecting unit into said second connecting unit through the accommodating port of said second unit, wherein said second connecting unit has a freely rotatable unit accommodating case for receiving and guiding said first connecting unit so that said first connecting unit does not come into contact with said electrical terminals of said second connecting unit when said first connecting unit is inserted into said second connecting unit, said unit accommodating case being rotatable together with said first connecting unit when said first connecting unit inserted through said

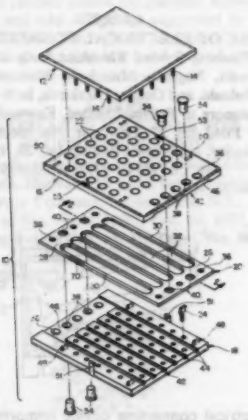
accommodating port is rotated in a direction almost at a right angle to the inserting direction, wherein said first connecting unit is locked in a connecting condition when said electrical terminals of said first connecting unit are connected to said electrical terminals of said second connecting unit through rotation of said first connecting unit, and wherein said second connecting unit further comprises means for locking said unit accommodating case so that the connecting condition with said first connecting unit can be maintained and means for releasing said locked connecting condition, wherein said unit accommodating case and said first connecting unit simultaneously rotate and return to the inserting condition when said releasing means releases the locked connecting condition, said first connecting unit being removeable from said unit accommodating case at said returning insertion condition.

4,468,076

ARRAY PACKAGE CONNECTOR AND CONNECTOR TOOL

Jean P. Hine, San Carlos, and Thomas H. McGaffigan, Orinda, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 23, 1982, Ser. No. 401,176
Int. Cl.³ H01R *13/20, 13/635*
U.S. Cl. 339—75 M **13 Claims**



1. A connector comprising:

a first board having a plurality of openings formed therethrough;

a second board having a plurality of contact elements associated therewith, said second board being mounted parallel to said first board and said contact elements being complementary to said openings and extending into said openings; and

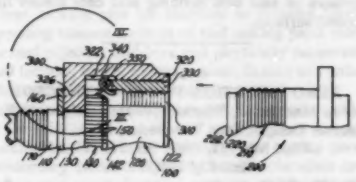
a heat-recoverable metal motion transmitting means interconnecting said first and second boards to move said boards relative to each other, movement of said boards causing engagement between said contact elements and the pins of a multipin module that may be inserted into said openings.

4,468,077

ELECTRICAL CONNECTOR ASSEMBLY HAVING AN ANTI-DECOUPLING DEVICE

Robert W. Brush, Sr., Unadilla, and Dee A. Werth, Afton, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 431,994
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—89 M **10 Claims**



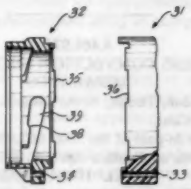
1. An electrical connector assembly having an anti-decoupling device comprising: first and second shells (**100, 200**) having front faces (**122, 222**) with said first shell (**100**) including on an outside portion thereof a plurality of radially extending ratchet teeth (**150**) forming a contiguous succession of longitudinal peaks and valleys (**152, 154**); a coupling nut (**300**) having an end wall (**325**) rotatably mounted to said first shell (**100**) and including first thread (**310**) connectable with corresponding second thread (**210**) on an outside portion of said second shell (**200**) for interconnecting the shells (**100, 200**); and an anti-decoupling device for retarding rotation of the coupling nut relative to said connector assembly, said anti-decoupling device characterized by: a looped spring member (**340**) including an apertured support portion (**346**) intermediate oppositely extending first and second hooked end portions (**342, 344**), the first hooked end portion (**342**) being disposed for engagement within successive valleys (**152**) of the ratchet teeth and said second hooked end portion (**344**) being disposed to be normally out of engagement with the ratchet teeth and adapted to be engaged by the front face (**222**) of said second shell (**200**) when a full mate condition is achieved.

4,468,078

FORWARDLY REMOVABLE COUPLING RING FOR AN ELECTRICAL CONNECTOR

David L. Frear, Afton; Stephen Punako; David W. MacAvoy, both of Bainbridge, and David O. Gallusser, Oneonta, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 28, 1982, Ser. No. 402,527
Int. Cl.³ H01R *13/20*
U.S. Cl. 339—90 R **10 Claims**



1. In combination with an electrical connector of the type having: a tubular housing having a central axis, a forward portion and a radially projecting annular shoulder; at least one electrical contact mounted in said housing; a tubular coupling member disposed around a portion of said housing, said coupling member having a forward portion adapted to connect to another housing having contacts adapted to mate with the contacts in said tubular housing; and means for rotatably

mounting the coupling member to said housing, the improvement wherein said coupling member and said means for rotatably mounting said coupling member comprises:

a groove in the forward portion of a housing;

a first annular member located between the groove and annular shoulder of said housing;

a snap ring in the groove in said housing to retain said first member on said housing forward of said shoulder;

a second annular member; and

means for removably connecting said first and second members together whereby said coupling member is rotatably mounted forwardly of said housing shoulder.

4,468,079

ELECTRICAL CONNECTORS AND TERMINAL CONNECTING BLOCKS

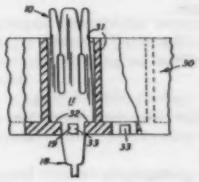
Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.

Division of Ser. No. 879,268, Feb. 21, 1978, Pat. No. 4,436,360, which is a continuation of Ser. No. 262,495, Jun. 14, 1972, Pat. No. 4,084,877, which is a continuation of Ser. No. 868,417, Oct. 22, 1969, abandoned. This application Jul. 27, 1983, Ser. No. 517,649

The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.

Int. Cl.³ H01R *9/08*

U.S. Cl. 339—97 P **2 Claims**



1. An electrical connector in the form of an integral spring metal piece comprising:

(a) a flat base portion;

(b) three contact fingers projecting from said base portion and lying at least substantially in the plane thereof, said three fingers including a symmetrical central finger and two bilaterally symmetrical outer fingers disposed each on a different side of said central finger,

(1) said central finger having a stem portion, a contact body portion and a tip portion, said stem portion commencing at said base portion and projecting therefrom and said contact body portion commencing at said stem portion and projecting outwardly to said tip portion,

(2) said stem portion of said central finger being narrower than said contact body portion of said central finger,

(3) each of said outer fingers having a stem portion commencing at said base portion and projecting from said base portion, a contact body portion, and a tip portion, with said stem portions and contact body portions of said outer fingers being disposed respectively beside and being of substantially the same length as said stem and contact body portions of said central finger,

(4) the side edges of said contact body portion of said central finger extending in substantial edge-to-edge contact with the adjacent inner side edge of each of the contact body portions of said outer fingers when the integral spring metal piece is in its normal undistorted condition,

(5) the outer side edges of said stem portions of said central finger being spaced apart from the adjacent inner side edge of each of the stem portions of said outer fingers, whereby said adjacent side edges cooperate to define elongated spaces between said stem portions,

(6) the outer side edges of each of the stem portions of each of said outer fingers tapering inwardly from adjacent the base toward the tip portion; and

(c) securing means for securing said connector into a terminal block, said securing means extending from said base portion in a direction opposite to said contact fingers and being narrower than said base portion, each of said outer fingers being resiliently displaceable relative to said central finger upon insertion of an electrical conductor between the contact body portion of each of said outer fingers and the contact body portion of said central finger.

4,468,080

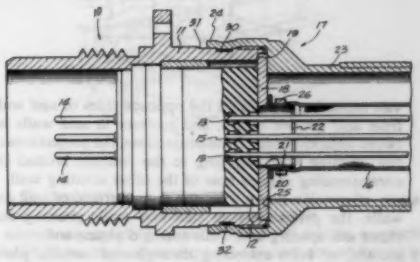
CABLE SHIELD TERMINATION MEANS FOR PLUG AND RECEPTACLE CONNECTORS

Michael K. Van Brunt, Santa Monica, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Jun. 22, 1981, Ser. No. 275,934

Int. Cl.³ H01R *13/46, 13/648*

U.S. Cl. 339—136 R **3 Claims**



1. An electrical connector half, comprising in combination:

an outer metal shell with an opening for receiving at least one cable wire with an enclosing shield;

a metal plate located within the shell opening in contact with the shell and having at least one opening therethrough;

a hollow metal tube secured in an opening of said plate for receiving the cable wire therein and to which tube the cable wire shield is electrically connected;

a hollow metal adapter secured to the metal shell over the shell opening and having parts abutting against the plate outwardly directed surface; and

said metal shell outer surface adjacent the opening therein being cylindrical and including a first slot extending circumferentially thereabout, said adapter being received onto the cylindrical shell and clamped thereto with parts of the adapter extending into the first slot.

4,468,081

TERMINAL ASSEMBLY FOR CIRCUIT INTERRUPTER

Yasushi Genba; Shigemi Tamaru; Takayoshi Ishikawa; Kiyoshi Eguchi, and Hideshi Takashita, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1982, Ser. No. 398,697

Claims priority, application Japan, Jul. 16, 1981, 56-106154[U]

Int. Cl.³ H01R *23/02*

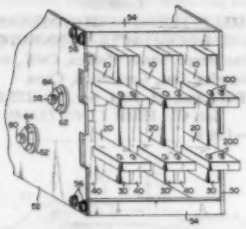
U.S. Cl. 339—176 M **2 Claims**

1. A terminal assembly for a circuit interrupter, comprising:

a plurality of pairs of metallic spaced parallel flat load terminals with the flat surfaces of the terminals of a pair opposed to each other, said pairs of terminals being positioned side-by-side with spaces therebetween, there being one pair for each phase of the interrupter;

a plurality of side walls of insulating material, two between each side-by-side pair of terminals and abutting each

other, and two end walls of insulating material on the outside of the outermost pairs of said terminals, said side walls and end walls having groove means therein in which the side edges of said terminals are engaged for being held between spaced opposed walls on the opposite sides of said terminals, said terminals projecting outwardly from between said side walls and said end walls past the edges of said wall on one side of said assembly, said side walls and end walls having substantially the same shape and having bolt receiving holes therethrough aligned with each other, and a plurality of projections at spaced inter-



vals around said holes on the opposite sides of said walls from said groove means, and recesses in said walls between adjacent ones of said projections, the projections on one abutting wall engaging in the recesses around the corresponding aligned hole of the other abutting wall;

a pair of metallic plates over the outer surface of said end walls, the projections on said end walls abutting said plates and spacing said walls and said plates; and

a plurality of bolts extending through said metallic plates and through said walls and holding said plates, walls and terminals in the assembled condition.

4,468,082

TERMINAL ASSEMBLY FOR CIRCUIT INTERRUPTER

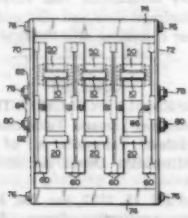
Shigemi Tamaru; Yasushi Genba; Takayoshi Ishikawa; Kiyoshi Eguchi, and Hideshi Takashita, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1982, Ser. No. 398,699

Claims priority, application Japan, Jul. 17, 1981, 56-106953[U]

Int. Cl.³ H01R *23/02*

U.S. Cl. 339—176 M **4 Claims**



1. A terminal assembly for a circuit interrupter, comprising:

a plurality of pairs of metallic spaced parallel flat load terminals with the flat surfaces of the terminals of a pair opposed to each other, said pairs of terminals being positioned side-by-side with spaces therebetween, there being one pair for each phase of the interrupter;

a plurality of side walls of insulating material, two between each side-by-side pair of terminals and abutting each other, and two end walls of insulating material on the outside of the outermost pairs of said terminals, said side walls and end walls having groove means therein in which the side edges of said terminals are engaged for being held between spaced opposed walls on the opposite sides of said terminals, said terminals projecting outwardly from between said side walls and said end walls past the edges of said walls on one side of said assembly;

a pair of metallic plates over the outer surface of said end walls, and a plurality of bolts extending through said metallic plates and through said walls and holding said plates, walls and terminals in the assembled condition;

a plurality of struts of insulating material, one on the edge of each of said walls past which said terminals project, the struts having notches in the sides thereof facing said terminals in which the edges of said terminals are engaged, the struts on the edges of the side walls having projection on the sides facing away from said terminals and mating recesses in the sides of the struts toward which said projection extend and in which said projections engage for holding said struts rigidly in engagement with each other and being at least at the ends of the struts, said projections being longer than the depth of said recesses for causing the opposed sides of the struts facing away from said terminals to be spaced from each other; and

fastening means only at the centers of the length of said struts holding said struts which are against the edges of said side walls to said side walls and holding said struts which are against the end walls against the respective metallic plates.

4,468,083

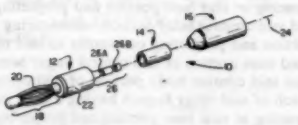
CRIMPED BANANA-TYPE ELECTRICAL CONNECTOR AND METHOD THEREOF

Noel Lee, Daly City, and Andrew L. Choy, San Francisco, both of Calif., assignors to Monster Cable Products, Inc., San Francisco, Calif.

Filed Dec. 17, 1981, Ser. No. 331,762

Int. Cl.³ H01R *11/22*

U.S. Cl. 339—252 P **2 Claims**



1. A banana-type connector comprising:

a solid cylindrical base member;

a male pin member extending from one end of said base member and including at least one expansible conductor portion;

a conductor post extending from the other end of said base member and including at least one recessed groove extending transversely to the axis of said post;

at least one wire extending adjacent, substantially parallel to, and in contact with, said conductor post;

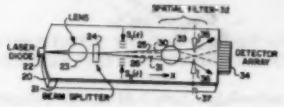
a crimped ferrule extending around said conductor post and said wire and crimped thereto to force said wire into engagement with said conductor post and into said groove; and

an insulating sleeve covering at least said crimped ferrule.

4,468,084
INTEGRATED OPTICAL TIME INTEGRATING CORRELATOR

Lynn D. Hutcheson, Hopkins, and Poohsan N. Tamura, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 22, 1982, Ser. No. 443,265
Int. Cl.³ G02B 5/174
U.S. Cl. 350—96.11 11 Claims



1. An integrated optical time integrating correlator comprising:

an optical waveguide comprising a thin layer of titanium diffused into the surface of a $LiNbO_3$ substrate;

said waveguide being adapted to have a laser beam propagated therethrough;

first integrated lens means positioned for collimating said laser beam;

integrated electro-optic beamsplitter means on said waveguide for causing a splitting of said collimated laser beam into two components including an undiffracted beam and a diffracted beam;

first and second integrated SAW (surface acoustic wave) transducers formed on said waveguide surface for producing first and second counter propagating surface acoustic waves;

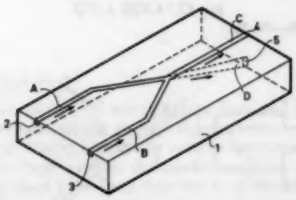
said first and second counter propagating surface acoustic waves positioned to interact, respectively, with said undiffracted beam and said diffracted beam to deflect portions of each of the two beams such that the two deflected beams propagate parallel to each other, overlap each other and are coded to carry the acoustic pattern; and,

integrated spatial filter means for imaging the acoustic pattern onto a detector array, and for eliminating the non-deflected non-coded portions of both of the undiffracted beam and the diffracted beam.

4,468,085
HYBRID OPTICAL JUNCTION AND ITS USE IN A LOOP INTERFEROMETER

Michel Papuchon; Hervé J. Arditty, and Claude Puech, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 2, 1981, Ser. No. 307,933
Claims priority, application France, Oct. 10, 1980, 80 21677
Int. Cl.³ G02B 5/174
U.S. Cl. 350—96.14 13 Claims



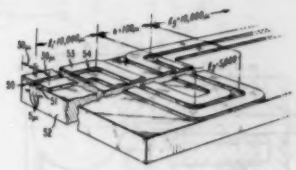
1. An integrated optical device, comprising: an integrated hybrid junction having two input paths and two output paths formed as a Y-shaped assembly of three monomodal optical wave-guides joined at a node situated inside a refractive medium having a lower refractive index than the refractive index of the wave-guides, the ends of these three wave-guides forming two inputs and one output, a second output being formed of a portion of the refractive medium, connecting the node of the three wave-guides to an output facet of the refractive medium.

8. A device as in claim 1, further comprising electrodes positioned on each side of the wave-guides, for modulating light signals.

4,468,086
TRAVELING WAVE, VELOCITY MISMATCHED GATE

Pao-Lo P. Liu, Morganville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 5, 1981, Ser. No. 318,353
Int. Cl.³ G02B 5/174
U.S. Cl. 350—96.14 6 Claims



1. In combination

first waveguiding means for optical signals,

second waveguiding means for electrical signals, supportive of a traveling wave, disposed adjacent to and interacting with said first waveguiding means,

said second waveguiding means including portions, at equally spaced intervals, which bend away from said first waveguiding means to produce regions of no interaction along said second waveguiding means.

4,468,087
DEVICE FOR COUPLING TWO OPTICAL FIBERS

Lucien R. Milan, Garches, and Roland R. Gousseau, Brunoy, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 205,068, Nov. 10, 1980, abandoned.
This application Apr. 25, 1983, Ser. No. 488,561
Claims priority, application France, Nov. 2, 1979, 79 27153
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.18 10 Claims

1. A device for detachably coupling a pair of optical fibers, said device comprising:

two coupling members, each coupling member having an axis and first and second ends, each coupling member having a recess at the first end, said recess having a circularly cylindrical inner wall which is rotationally symmetric about the axis, each coupling member having a bore extending from the second end into the recess; and

means for detachably connecting the coupling members to each other;

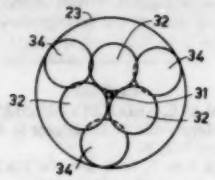
characterized in that each coupling member further comprises:

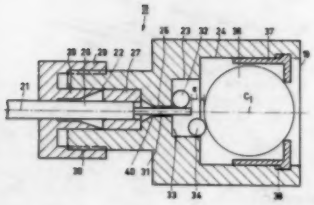
a first set of balls arranged in the recess around the axis, in operation the first set of balls surrounding and contacting an optical fiber to be coupled, the diameter of the recess being larger than the diameter of the smallest circle which can be circumscribed around the first set of balls when they are contacting the optical fiber;

a second set of balls arranged in the recess around the first set of balls such that each ball of the second set bears on the inner wall of the recess and on two balls of the first set but not on the optical fiber to be coupled, thereby pressing

the balls of the first set away from the inner wall of the recess and against the optical fiber; and

a reference face, on the first end of the coupling member, directed transverse to the axis, the reference faces of two coupling members contacting each other when the members are coupled to each other.





2. A device as claimed in claim 1, characterized in that each coupling member further comprises:

a spherical lens arranged on the axis in contact with the second set of balls; and

means for clamping the lens into this position.

4,468,088

OPTICAL TELECOMMUNICATION ELEMENT

Willem van der Hoek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 238,174

Claims priority, application Netherlands, Mar. 28, 1980, 8001832

Int. Cl.³ G02B *5/16*

U.S. Cl. 350—96.23 **5 Claims**

1. An optical telecommunication element comprising:

a cylindrical sheath having an inner wall and having an axis; and

at least one optical fiber inside the sheath, said optical fiber following a helical or quasi-helical path having alternating left-handed and right-handed pitch as the fiber winds down the axis, said optical fiber being fixed to the inner wall of the sheath at points where the pitch changes handedness.

4,468,089

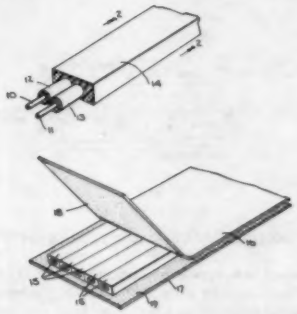
FLAT CABLE OF ASSEMBLED MODULES AND METHOD OF MANUFACTURE

William J. Brorein, Whippany, N.J., assignor to GK Technologies, Inc., Greenwich, Conn.

Filed Jul. 9, 1982, Ser. No. 396,773

Int. Cl.³ G02B *5/16*; H01B *11/00*

U.S. Cl. 350—96.23 **25 Claims**



1. A flat cable comprising a ribbon containing a plurality of modules all having substantially the same external dimensions consisting of a standardized width and a lesser height and being adherently united in edge-to-edge assembly and surrounded by an adherent covering layer of material, each module including one or more signal conductors individually covered with a layer of polyolefin material and embedded non-adherently within a plastic sheath.

25. The method of producing a flat ribbon cable, characterized by the steps of fabricating a plurality of lengths of plastic covered conductors non-adherently sheathed, in turn, with a plastic sheathing material to produce modules all of which have substantially the same external dimensions consisting of a standardized width and a lesser height, assembling selected modules in side-by-side edge-to-edge relationship, surrounding said assembled modules along their length with a covering layer of plastic material, and applying heat and pressure to unite adjacent modules adherently together and to said covering layer.

4,468,090

FIBRE OPTICAL ARRANGEMENT FOR THE TRANSMISSION, IN A MANNER PRESERVING ITS POLARIZATION, OF LIGHT OF A DEFINED, LINEAR POLARIZATION STATE

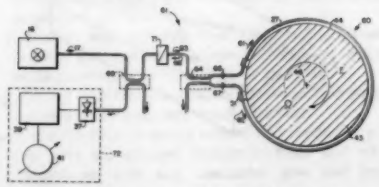
Reinhard Ulrich, Alte Rennbahn 2, 2110 Buchholz, Fed. Rep. of Germany, and Scott Rashleigh, 2651 Arlington Dr. Nr. 301, Alexandria, Va. 22306

Filed Jul. 20, 1981, Ser. No. 284,791

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027476

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.30 **5 Claims**



1. A fiber optical arrangement for a transmission of light of

a defined linear polarization state in such a manner so as to preserve a polarization of the light using a fiber optical waveguide having a linear birefringence of an amount sufficient to provide extensive decoupling of polarization-degenerate modes of oscillation of the light that can propagate within the fiber, characterized in that an amount of linear birefringence β necessary for decoupling the polarization-degenerate modes of oscillation is achieved by a winding of an optical fiber in an elastically extended condition upon a winding form and fixing the optical fiber on the winding form in the elastically extended condition.

4,468,091

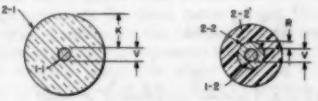
FIBER OPTIC ENERGY SENSOR AND DEMODULATION SYSTEM AND METHOD OF MAKING SAME

Donald Schmadel; William H. Culver, and Gordon Gould, all of Gaithersburg, Md., assignors to Optelecom, Incorporated, Gaithersburg, Md.

Division of Ser. No. 132,274, Mar. 20, 1980, Pat. No. 4,360,272. This application Jul. 28, 1982, Ser. No. 402,578

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.30 **4 Claims**



1. Means for phase modulating electro-magnetic radiation traveling in the core of an optical fiber comprising:

an etched optical fiber; and

means for longitudinally stretching or compressing the etched optical fiber, wherein the etched optical fiber is coated with a material having an optical index lower than that of the etched optical fiber's core and having a modulus of elasticity lower than that of the material which was removed by etching.

4,468,092

REAR PROJECTION SCREEN

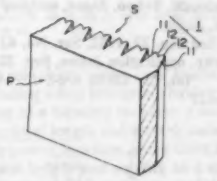
Masao Inoue, and Shingo Suzuki, both of Tokyo, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,509

Claims priority, application Japan, Feb. 25, 1982, 57-29178

Int. Cl.³ G03B *21/60*

U.S. Cl. 350—128 **21 Claims**



1. A rear projection screen having front and rear surfaces and a light transmitting medium therebetween,

the screen being adapted to receive light rays at the rear surface and transmit the rays through the medium and cause them to emanate from the front surface,

the front surface being formed with a plurality of parallel lenticule units arranged to disperse emanating light rays over a wide angle,

each lenticule unit being formed with a pair of flanks and with a crest having only two curved surfaces, one adjacent to each flank,

each flank having a portion extending toward the rear surface of the screen which forms an angle greater than the critical angle to the plane of the rear surface so as to provide a total reflection surface to reflect transmitted rays incident on that flank portion and cause them to emanate through the adjacent curved surface.

4,468,093

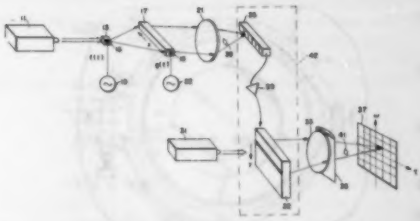
HYBRID SPACE/TIME INTEGRATING OPTICAL AMBIGUITY PROCESSOR

Douglas E. Brown, Columbia, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Ft. George G. Meade, Md.

Filed Dec. 9, 1982, Ser. No. 448,109

Int. Cl.³ G02B *5/18*; G06G *9/00*; G01S *13/58*

U.S. Cl. 350—162.12 **10 Claims**



1. An optical processing apparatus, comprising:

first means for providing a light beam;

first modulating means for intensity modulating said beam with a first electrical signal f(t);

second modulating means for modulating the output of said modulating means with a second electrical signal g(t) along a first spatial dimension, x;

a two-dimensional optical modulator placed to receive successive outputs from said second modulating means and to transform said outputs to positions along a second spatial dimension, y;

second means for providing a light beam to illuminate said two-dimensional optical modulator;

a detector; and

optical means for imaging the output of said two-dimensional modulator along a first axis and transforming said output along a second axis perpendicular to said first axis, and for illuminating the detector with the resulting light beam.

4,468,094

DACH MIRROR ARRAY

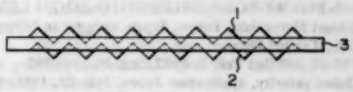
Toshiyuki Inokuchi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,949

Claims priority, application Japan, Aug. 17, 1981, 56-128621

Int. Cl.³ G02B *5/08, 5/10, 5/124, 5/136*

U.S. Cl. 350—299 **6 Claims**



1. A roof mirror array comprising:

a front and a rear surface on which a plurality of chevron faces of an equal configuration are formed so that a peak

portion on a first surface of each of said chevron faces is aligned with a valley portion on a second surface of each of said chevron faces, wherein at least one of the first and second surfaces further comprises a roof mirror surface; and

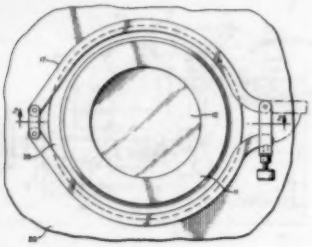
a holding frame disposed so as to surround an exterior portion of a central region between each of said plurality of chevron faces.

4,468,095

SIGHT GLASS ASSEMBLY

Charles E. Meginnis, deceased, late of Charleston, W. Va. (by Stanley T. McKeny, executor), assignor to Pressure Products Company, Inc., Charleston, W. Va.

Filed Mar. 2, 1982, Ser. No. 353,926
Int. Cl.³ G02B 5/00; G01F 23/02
U.S. Cl. 350—319 **10 Claims**



1. A sight glass assembly comprising a first housing section having an opening therethrough, mountable on a vessel wall having an opening therein so that said first housing section opening registers with said vessel wall opening, said opening of said first housing section having an enlarged section, a second housing section cooperable with said first housing section, having an opening therethrough registered with the opening in said first housing section, said opening in said second housing section having an enlarged section disposed in opposed relation to the enlarged section of the opening in said first housing section, a lens disposed across said openings having the periphery thereof disposed between said housing sections and received within said enlarged sections of the openings of said housing sections, a sealing ring assembly disposed in the enlarged sections of said housing section openings, including a rigid compression ring and a resilient packing member, said compression ring being engageable with one of said housing sections, said packing member having an L-shaped cross-sectional configuration including an annular wall portion mounted on an inner side of said compression ring and engaging the periphery of said lens and a flange portion mounted on an end of said compression ring and engaging the other of said housing sections, and means for urging said housing sections together so that said compression ring will be forced against said packing member, causing it to expand laterally, thereby effecting a seal between the periphery of the lens and said housing sections and placing said lens in radial compression.

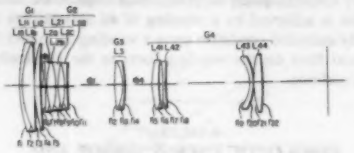
4,468,096

FOUR-GROUP TELEPHOTO ZOOM LENS

Yoshinari Hamanishi, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 8, 1982, Ser. No. 346,995
Claims priority, application Japan, Feb. 23, 1981, 56-25073
Int. Cl.³ G02B 9/64, 15/18
U.S. Cl. 350—427 **10 Claims**

1. A four-group zoom lens including, in succession from the object side, a first group (G_1) having a positive refractive power and movable on the optical axis for focusing, a second group (G_2) having a negative refractive power and movable on the optical axis to vary the total focal length of the entire system, a third group (G_3) having a positive refractive power and movable on the optical axis to keep the image plane at a predetermined position, and a fourth group (G_4) as a relay lens system having a positive refractive power, said second group



(G_2) having a cemented lens component (L_{21}) comprising three negative, positive and negative lenses (L_{2a}, L_{2b}, L_{2c}) cemented together and having a composite negative refractive power, and a negative lens component (L_{22}), and in which said zoom lens satisfies the following conditions:

$$1.0 < \frac{f_{21}}{f_{22}} < 1.9 \tag{1}$$

$$0.5 < \frac{r_{11} + r_{10}}{r_{11} - r_{10}} < 1.2 \tag{2}$$

$$-0.1 < f_{21}\left(\frac{1}{f_{2a}\nu_{2a}} + \frac{1}{f_{2b}\nu_{2b}}\right) < -0.03 \tag{3}$$

$$-0.07 < f_{21}\left(\frac{1}{f_{2b}\nu_{2b}} + \frac{1}{f_{2c}\nu_{2c}}\right) < -0.03 \tag{4}$$

$$0.1 < n_5 - n_6 < 0.3 \tag{5}$$

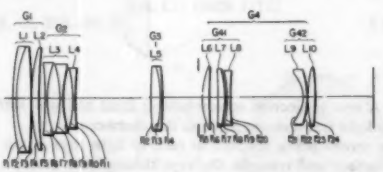
where f_{21} and f_{22} are the focal lengths of the cemented negative lens component (L_{21}) and negative lens component (L_{22}) in said second group, f_{2a}, f_{2b} and f_{2c} are the focal lengths of the negative, positive and negative lenses (L_{2a}, L_{2b}, L_{2c}) forming said cemented negative lens component (L_{21}), ν_{2a}, ν_{2b} and ν_{2c} are the Abbe numbers of these lenses, n_5 and n_6 are the refractive indices of the positive lens (L_{2b}) and rearward negative lens (L_{2c}) forming said cemented negative lens component (L_{21}), and r_{10} and r_{11} represent the object side and image side surfaces of said negative lens component (L_{22}).

4,468,097

FOUR-GROUP GREAT APERTURE RATIO ZOOM LENS

Yoshinari Hamanishi, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,421
Claims priority, application Japan, Sep. 28, 1981, 56-153206
Int. Cl.³ G02B 9/64, 15/18
U.S. Cl. 350—427 **9 Claims**



1. A great aperture ratio zoom lens having, in succession from the object side, a first lens group of positive refractive power having a focusing function, a second lens group of negative refractive power having a magnification changing

function, a third lens group of positive refractive power having a correcting function for keeping the image plane at a predetermined position, and a fourth lens group of positive refractive power having an imaging function, said first to third lens groups forming a substantially afocal magnification changing portion, characterized in that said fourth lens group includes, in succession from the object side, a forward group comprising a positive meniscus lens component having its convex surface facing the object side, a positive lens component having its surface of sharper curvature facing the image side, and a biconcave lens component, and a rearward group having a negative lens component and a positive lens component, and said zoom lens satisfies the following conditions:

$$-0.3<Nb-Na<0.3 \quad (1)$$

$$-3.0<qa<-0.5 \quad (2)$$

$$-0.5<qb<1.0 \quad (3)$$

$$0.8<f_{41}/f_4<1.2 \quad (4)$$

where Na represents the refractive index of the positive lens component in said forward group which has its surface of sharper curvature facing the image side, qa represents the shape factor of said positive meniscus lens component, Nb represents the refractive index of said biconcave lens component, qb represents the shape factor of said biconcave lens component, f_4 represents the composite focal length of said fourth lens group, and f_{41} represents the composite focal length of said forward group (the shape factor q is defined by $q=(r_1+r_2)/(r_1-r_2)$ when the radius of curvature of the lens surface of said lens which is adjacent to the object side is r_1 and the radius of curvature of the lens surface of said lens which is adjacent to the image side is r_2).

4,468,098

COMPACT TELEPHOTO ZOOM LENS SYSTEM

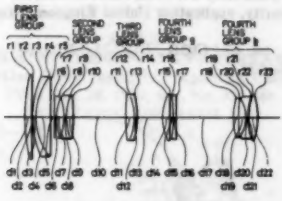
Takayuki Itoh, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,501

Claims priority, application Japan, Oct. 6, 1981, 56-159043

Int. Cl.³ G02B 9/64, 15/14

U.S. Cl. 350—427 **2 Claims**



1. A compact telephoto zoom lens system comprising a variator unit including a first lens group having a positive focal length and serving as a focusing member, a second lens group having a negative focal length and serving mainly as a variator having a variable power function, and a third lens group having a positive focal length and serving as a compensator for maintaining an image surface constant, and a relay lens unit following said variator unit, said first lens group being composed of a positive lens and a cemented lens assembly of a negative meniscus lens having a convex side direction toward the object and a positive lens, said second lens group being composed of a negative lens and a cemented lens assembly of a biconcave negative lens and a positive lens, said third lens group being composed of a cemented lens assembly of a biconvex positive lens and a negative meniscus lens, said relay lens unit being composed of a fourth lens group a having a positive lens with a large-curvature convex surface directed toward the object and a negative lens, and a fourth lens group b spaced from said fourth lens group a and having a positive meniscus lens, a biconcave negative lens, and a biconvex positive lens, said telephoto zoom lens satisfying the following conditions:

$$0.4 < \frac{f_{min}}{f_I} < 0.9 \quad (1)$$

$$-1.5 < \frac{f_{min}}{f_{I\text{-}II}} < -1.0 \quad (2)$$

$$-0.25 < \frac{f_{min}}{f_{I\text{-}III}} < 0.15 \quad (3)$$

$$1.0 < \frac{f_{min}}{f_{I\text{-}IVa}} < 1.5 \quad (4)$$

$$-0.8 < \frac{f_{min}}{f_{IVb}} < -0.2 \quad (5)$$

$$0.03 < \frac{d_{19}}{f_{min}} < 0.1 \quad (6)$$

$$0 < \frac{f_{min}}{r_{19}} < 1.0 \quad (7)$$

$$0.23 < \frac{|r_{20}|}{f_{min}} < 0.5 \quad (r_{20} < 0) \quad (8)$$

$$1.75 < N_{20} \quad (9)$$

$$0.0 \leq \frac{d_{21}}{f_{min}} < 0.05 \quad (10)$$

$$0.1 < N_{20} - N_{22} < 0.35 \quad (11)$$

where f_{min} is the focal length of the overall system at the minimum focal length,

f_I is the focal length of the first lens group,

$f_{I\text{-}II}$ is the resultant focal length of the first and second lens groups at the minimum focal length,

$f_{I\text{-}III}$ is the resultant focal length of the first through third lens groups at the minimum focal length,

$f_{I\text{-}IVa}$ is the resultant focal length of the first group through fourth lens group a at the minimum focal length,

f_{IVb} is the focal length of the fourth lens group b,

d_{19} is the aerial space between the positive meniscus lens on the object side and the biconcave lens in the fourth lens group b,

r_{19} is the radius of curvature of the image side surface of the positive meniscus lens on the object side in the fourth lens group b,

r_{20} is the radius of curvature of the object side surface of the biconcave lens in the fourth lens group b,

N_{20} is the refractive index of the biconcave lens in the fourth lens group b at d-line,

d_{21} is the aerial space between the biconcave lens and final biconvex lens in the fourth lens group b, and

N_{22} is the refractive index of the final biconvex lens in the fourth lens group b at d-line.

4,468,099

TELEPHOTO OBJECTIVE

Keiji Ikemori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,565

Claims priority, application Japan, Oct. 9, 1980, 55-141190; Nov. 1, 1980, 55-154019

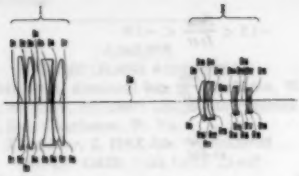
Int. Cl.³ G02B 9/64, 13/02

U.S. Cl. 350—454 **9 Claims**

1. A telephoto objective comprising:

a front group of positive power and a rear group of negative power;

said front group having, from front to rear, a first lens of positive power, a second lens of positive power with its convex surface towards the rear, a third lens of negative power with a concave surface towards the front, and a fourth lens of positive power with a convex surface towards the front;



letting f 1 denote the focal length of said first lens, $\nu 1$ the Abbe number of the glass thereof;

f2 the focal length of said second lens, $\mu 2$ the Abbe number of the glass thereof;

Dl the axial length of said front group, and

D4 the air separation between said second lens and said third lens, the following inequalities are satisfied;

$$1.6 < \frac{f_1}{f_2} < 4.0$$

$$10 < \nu 2 - \nu 1 < 30$$

$$0.1 < \frac{D_4}{D_l} < 0.4;$$

the refractive power of the rear surface of said first lens being stronger than that of the front surface of the first lens.

4,468,100

WIDE-ANGLE PHOTOGRAPHIC LENS

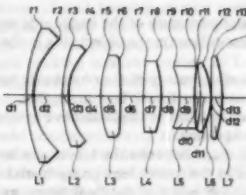
Takayuki Itoh, and Yasunori Arai, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 422,502

Claims priority, application Japan, Oct. 9, 1981, 56-161448

Int. Cl.³ G02B *9/64*

U.S. Cl. 350—463 **3 Claims**



1. A small-size and high-performance wide-angle photographic lens system having seven lens elements grouped into seven lens components, including first and second components each consisting of negative meniscus lenses with convex surfaces directed to the object, a third component consisting of a positive lens having a large-curvature convex surface directed to the object, a fourth component consisting of a positive lens having a large-curvature convex surface directed to the image, a fifth component consisting of a biconcave negative lens, a sixth component consisting of a positive meniscus lens having a convex surface directed to the image, and a seventh component consisting of a positive lens, said lens system satisfying the following conditions:

$$-1.4 < \frac{f}{f_{I\text{-}II}} < -0.9 \quad (1)$$

$$0.3 < \frac{f_{I\text{-}II}}{f_I} < 0.65 \quad (2)$$

$$0.4 < \frac{d_1 + d_2 + d_3 + d_4}{f} < 0.8 \quad (3)$$

$$1.5 < \frac{N_I + N_{II}}{2} < 1.6 \quad (4)$$

$$1.0 < \frac{f}{f_{I-IV}} < 1.5 \quad (5)$$

$$0.4 < \frac{f_{III\text{-}IV}}{f_{III}} < 0.75 \quad (6)$$

$$0.7 < \frac{r_3}{f} < 1.3 \quad (7)$$

$$0.02 < \frac{d_{10}}{f} < 0.1 \quad (8)$$

where

f is the focal length of the overall lens system,

$f_{I\text{-}II}$ is the resultant focal length of the first and second components,

f_I is the focal length of the first component,

d_i is the thickness or spacing of the i-th lens,

N_I, N_{II} are the refractive indexes of the first and second components at d-line,

f_{I-IV} is the resultant focal length of the first through fourth components,

$f_{III\text{-}IV}$ is the resultant focal length of the third and fourth components,

f_{III} is the focal length of the third component, and

r_i is the radius of curvature of the i-th lens surface.

4,468,101

NIGHT VISION GOGGLES

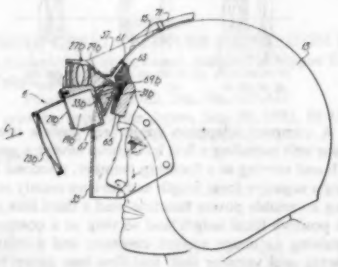
Stafford M. Ellis, West Sussex, England, assignor to Marconi Avionics Limited, England

Filed May 24, 1982, Ser. No. 381,403

Claims priority, application United Kingdom, May 29, 1981, 8116451

Int. Cl.³ G02B *23/06, 23/12, 23/18*

U.S. Cl. 350—538 **8 Claims**



1. In combination, headgear and an optical device for use as a night vision goggle, said optical device being attached to said headgear and comprising:

(A) an image intensifier having input and output faces which are respectively directed rearwards and forwards, that is to say in directions respectively away from and towards the scene forward of the eyes of a user wearing the headgear;

(B) forward of the output face of the image intensifier, a viewing eyepiece which in use intercepts the output face of the image intensifier to the viewing position of the user; and

(C) an optical system which incorporates an objective and ray-folding means and receives the forward scene and directs said radiation to the input face of the image intensifier.

4,468,102

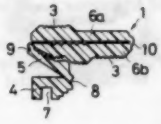
LENS SHADE

Mitsuo Chikano, Fussa, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Feb. 17, 1982, Ser. No. 349,206

Int. Cl.³ G02B 7/00; G03B 11/04

U.S. Cl. 350—581 **4 Claims**



1. A camera lens shade (1) of a flexible material, comprising a conical part (5) and a cylindrical main part (6) continuously connected to the larger end of said conical part (5), said conical part (5) being provided at its smaller end with a base part (4) having means (7) for engagement with a shade support, first and second annular hinge sections (8) and (9) joining parts (4) and (5), and parts (5) and (6) respectively, and a third annular hinge section (10) being provided at the approximately central portion of said cylindrical main part (6), said third annular hinge section (10) dividing said main part into front and rear main portions (6*a*) (6*b*), whereby said conical part (5) is foldable at said first hinge section (8) onto said base part (4), said rear main portion (5*b*) is foldable at said second hinge means (9) onto said conical part (5) and said front main portion (6*a*) is foldable back toward the outside at said third hinge section (10) onto said rear main portion (6*b*), so as to change the length of the lens shade according to the focal length and the angle of view of the camera lens system with which the lens shade is used.

4,468,103

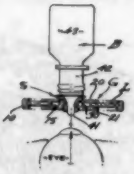
EYE MEDICATION DISPENSING FRAMES AND INSERT

Milton Meckler, 16348 Tupper St., Sepulveda, Calif. 91343

Filed Dec. 28, 1981, Ser. No. 335,068

Int. Cl.³ G02C 1/00; A61M 1/00

U.S. Cl. 351—158 **16 Claims**



1. A therapeutic frame for adiministering liquids by gravity from an eyedropper and onto a selective area of a person's eyeball, and including; a frame comprised of a nose bridge carrying spaced rims for disposition over the eyes of the person, at least one of said rims carrying a lens with a central opening therethrough and a shiftable guide comprised of inner and outer slides and a barrel passing through said opening with restricted lateral clearance with the inner and outer slides frictionally embracing the lens for adjustable lateral positioning with respect to the rim, there being a bore through the barrel of the guide to receive and locate the eyedropper over an area of the person's eyeball where medication is to be applied.

4,468,104

WORKING DISTANCE DETECTING DEVICE FOR OPHTHALMIC INSTRUMENTS

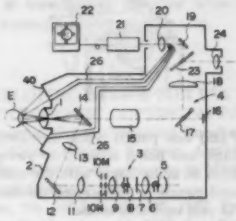
Kazuo Nunokawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Filed Jul. 31, 1981, Ser. No. 289,070

Claims priority, application Japan, Aug. 4, 1980, 55-106925

Int. Cl.³ A61B 3/14

U.S. Cl. 351—206 **5 Claims**



1. An ophthalmic instrument comprising an observing optical system for observing a patient's eye, said observing optical system having objective lens means adapted to be located at a working distance from the cornea of a patient's eye, an illuminating optical system having an illuminating optical axis for projecting beams of illuminating light to the patient's eye through the objective lens means, said illuminating optical system including a first annular aperture adapted to be located at a position substantially conjugate with the cornea of the patient's eye with respect to the objective lens means, a second annular aperture spaced by a predetermined distance along said illuminating optical axis from said first annular aperture, at least one light-shading portion provided in one of said annular apertures and having a selected width in the circumferential direction, light source means for projecting the beams of illuminating light to the eye through said apertures and the objective lens means, and a working distance detecting device comprising a light-receiving portion disposed around said objective lens means at a position corresponding to said light-shading portion of an image of said one annular aperture formed by beams of the illuminating light reflected from the cornea of the eye, whereby the working distance between the objective lens means and the cornea of the eye is detected based on the width of the light-shading portion of the image of said one annular aperture at said light-receiving portion.

4,468,105

OPAQUE PROJECTOR

John R. Montgomery, Fairfield, Conn., assignor to Constantin Systems, Inc., Chicago, Ill.

Filed Apr. 7, 1982, Ser. No. 366,424

Int. Cl.³ G03B 21/06

U.S. Cl. 353—66 **18 Claims**

1. An opaque projector characterized by a transportable mode and an operable mode comprising:

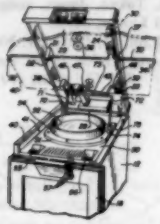
case means including end panels, side panels, a base and a top, said top being in a closed position when said projector is in said transportable mode and an open position when said projector is in said operable mode;

mechanical means, cooperating with said top, enabling said top to be maintained in said open position at a first acute angle relative to the plane defined by said top in said closed position when said projector is in said operable mode; and

mounting means for holding a mirror adjacent said top at a

second acute angle with the plane defined by said top in said closed position when said projector is in said operable mode;

wherein said side panels are in a closed position when said projector is in said transportable mode, said side panels defining substantially parallel planes substantially perpendicular to said base when in said closed position;



at least one of said side panels being movably mounted to said case means, and being adapted to swing to an open position to form an acute angle with the plane defined by said one of said panels in said closed position, when said projector is in said operable mode.

4,468,106

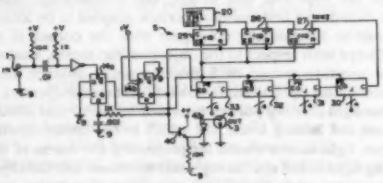
CAMERA SYSTEM

Joel G. Broida, 110 Dielman Rd., St. Louis, Mo. 63124

Filed Jul. 28, 1980, Ser. No. 172,774

Int. Cl.³ G03B *15/03*

U.S. Cl. 354—137 **4 Claims**



1. In a camera system wherein a shutter is opened to expose a photographic, sensitized film to light to record an image and the shutter is subsequently closed after a predetermined time, and a flash device is activated during the time the shutter is open, the improvement comprising electrical timing means operatively connected to be initiated by the opening of the shutter, and to said flash device for energizing the said flash device after a predetermined time interval following the initiation of the timer by the opening of the shutter and before said shutter is closed, said time interval being sufficiently long to cause the image of a moving object to blur before the flash device is energized and the shutter is closed.

4,468,107

MACRO-FOCUSSING REAR CONVERTER LENS

Shinji Yabe, Tokyo, Japan, assignor to Yabe Optical Inst. Mfg. Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,806

Claims priority, application Japan, Feb. 25, 1982, 57-28147

Int. Cl.³ G03B *3/00*; G02B *7/04*

U.S. Cl. 354—286 **10 Claims**

1. A macro-focusing rear converter lens system adapted to be inserted between a camera body and a master lens assembly comprising:

a cylindrical main body,

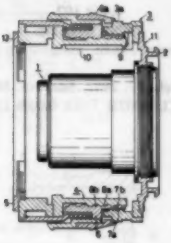
a mounting asembly on said main body for mounting it on the camera body,

a rear converter lens system for elongating the focal length of said master lens, said rear converter lens system having an optical axis and means for mounting said lens system inside said main body in fixed relation on the camera body,

a tube fitted coaxially within said main body and being movable along said optical axis,

means on a front end of said tube for mounting said master lens assembly thereon,

a revolving ring assembly inserted rotatively between said



main body and said tube for moving said tube along said optical axis by rotation of said revolving ring assembly, and

means for rotating said revolving ring assembly for moving said tube along said optical axis to vary the interval between said master lens assembly and the camera body while said rear converter lens system remains fixed relative to the camera body, whereby the camera is focused for macro-photography.

4,468,108

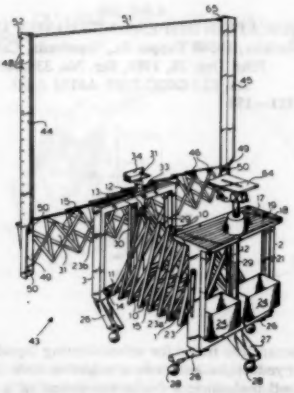
FOLDABLE PHOTOGRAPHIC OBJECT AND CAMERA SUPPORT

Jules Pinsley, 84-21 Smedley St., Jamaica, N.Y. 11435, assignor to Peter Humphrey, New York and Jules Pinsley, Tuxedo Park, both of, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,981

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—293 **3 Claims**



1. A foldable object and camera support comprising:

a first frame for holding the object;

a second frame for holding the camera;

a foldable connecting structure adapted to dispose said first and second frame at a variable distance with respect to each other and comprising first three triangulated lazy

tongs, each of said tong having end joints respectively connected to said first and second frames; and

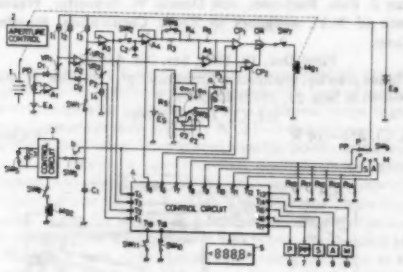
another connecting means comprising second three triangulated lazy tongs, said another connecting means having a central portiion connected to said first frame; and two distal bars disposed on either side of said central portion and connected to second end joints of said second lazy tongs, said second lazy tongs being oriented transversally with respect to said first lazy tongs; whereby said distal bars can support said object transversally with respect to said first connecting means.

4,468,109

CAMERA WITH AUTOMATIC EXPOSURE CONTROL AND DISPLAY DEVICE

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 1, 1982, Ser. No. 438,311
Claims priority, application Japan, Nov. 6, 1981, 56-178097
Int. Cl.³ G03B 7/08
U.S. Cl. 354—442 **7 Claims**



7. A camera comprising:

(a) shutter speed setting means including a switch operable to a plurality of positions to provide a corresponding plurality of preset exposure time values;

(b) means for producing a plurality of outputs with different levels corresponding to said plurality of positions, respectively;

(c) means for determining a combination of exposure time value and diaphragm value in accordance with a predetermined program to provide an appropriate exposure dependent upon the luminance of an object; and

(d) means for selecting the predetermined program in accordance with the outputs at said plurality of positions, respectively.

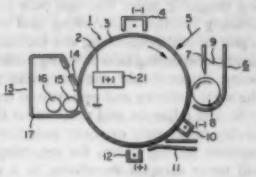
4,468,110

METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHY

Koichi Tanigawa, Tokyo; Masaharu Ohkubo, Yokohama; Masayoshi Takahashi, Chofu, and Yasuyuki Tamura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,939
Claims priority, application Japan, Jun. 26, 1981, 56-100167
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 TR **9 Claims**

1. In an electrophotographic process including the steps of forming, on a photosensitive medium, an electrostatic latent image corresponding to optical information applied on said photosensitive medium, developing said electrostatic latent image by reversal development using a developer and transferring said developed image onto a transfer material, the improvement residing in that a voltage having a polarity opposite to the polarity of said developer is applied to said photosensitive medium at least during the time from the end of said reversal development to said transfer step.

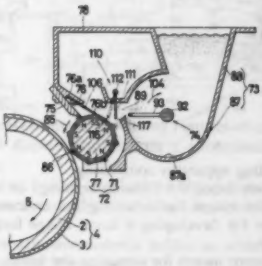


4,468,111

DEVELOPING DEVICE FOR USE ON AN ELECTROSTATIC COPYING APPARATUS

Ryutaro Yamagata, Hyogo; Nobuhiko Kozuka, Osaka; Hitoshi Nishihama, Osaka; Shigeo Koyama, Osaka, and Kazutada Sakai, Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Division of Ser. No. 265,565, May 20, 1981, Pat. No. 4,436,412.
This application Aug. 18, 1982, Ser. No. 409,108
Int. Cl.³ G03G 15/09
U.S. Cl. 355—3 DD **8 Claims**



1. A developing device for use in an electrostatic copying apparatus to transform an electrostatic latent image formed on a photoreceptor into a visible toner image, said device comprising:

a developing roller adapted to be positioned adjacent a photoreceptor and including a fixedly positioned permanent magnet and a hollow developing sleeve formed of a non-magnetic material and mounted coaxially about said permanent magnet for rotation thereabout, whereby one-component magnetizable toner supplied to the periphery of said sleeve forms thereon a magnetic brush which is conveyed by rotation of said sleeve to a developing position whereat the toner is transferred to the photoreceptor as a visible toner image;

a bristle cutting member, positioned upstream of said developing position with respect to the direction of rotation of said sleeve, for restricting the length of the magnetic brush;

means for preventing solidification of the toner on said periphery of said sleeve, said preventing means comprising a blade member formed of a non-magnetizable material and positioned upstream of said bristle cutting member, said blade member being in sliding contact with said periphery of said sleeve at a scraping position and being inclined away from said periphery in a direction downstream from said scraping position, whereby toner scraped from said periphery by said blade member is moved away

from said periphery in said downstream direction by said blade member;

said permanent magnet having spaced therearound at equal circumferential intervals a plurality of magnetizing positions having magnetic poles, one said pole being at a first said magnetizing position confronting said bristle cutting member, a pair of said poles being at a second said magnetizing position confronting said scraping position, said pair of poles being adjacent said one pole, said pair of poles being of the same polarity and opposite to the polarity of said one pole, and adjacent said poles other than said pair of poles having alternately opposite polarities; and

said blade member having means for returning to said periphery said toner scraped therefrom, at a position substantially midway between said second and first magnetizing positions.

4,468,112

DEVELOPER CONCENTRATION CONTROLLING DEVICE

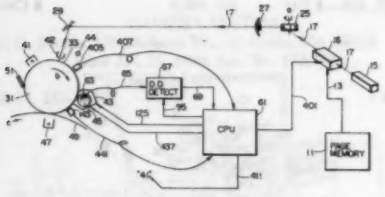
Akio Suzuki, Tokyo, and Kazuhiro Hirayama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 347,789

Claims priority, application Japan, Feb. 18, 1981, 56-21345; Feb. 18, 1981, 56-21346; Feb. 18, 1981, 56-21347

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 D **17 Claims**



1. A recording apparatus comprising:

plural process means for forming an image on a member;

first detector means for detecting the concentration of a developer for developing a latent image formed on said member;

second detector means for detecting the image density; and

control means for controlling at least one of said process means in response to the output signals from said first and second detector means.

4,468,113

TRANSFER TYPE ELECTROSTATIC REPRODUCING APPARATUS

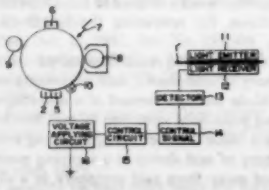
Mitsuo Motohashi, and Mitsugu Nemoto, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1982, Ser. No. 433,432

Claims priority, application Japan, Oct. 12, 1981, 56-161054; Oct. 12, 1981, 56-161055

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 TR **12 Claims**



1. In an electrostatic reproducing apparatus which operates for developing an electrostatic latent image on a photosensitive member to a toner image through a development means and transferring said toner image to a transfer paper through a transfer means, the improvement characterized in that said electrostatic reproducing apparatus is provided with a transfer paper thickness detecting means and an exposure means between the development means and the transfer means, the quantity of light to be irradiated onto the photosensitive member from said exposure means is adjusted according to a paper thickness information of said paper thickness detecting means.

4,468,114

HIGHER PRODUCTIVITY RECIRCULATIVE DOCUMENT COPYING

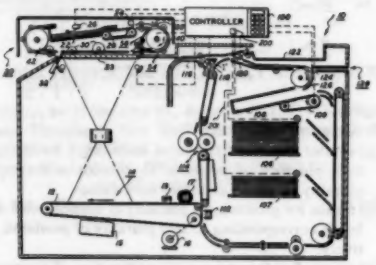
Susan J. Pels, Rochester, and Donald W. Schaeffer, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 10, 1982, Ser. No. 448,655

Claims priority, application European Pat. Off., Sep. 21, 1982, 82304964.8; Sep. 21, 1982, 82304965.5

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **6 Claims**



1. In a method of recirculatively precollatively copying a set of plural original documents onto both sides of copy sheets to produce a desired plural number precollated duplex copy sheet sets, by normally copying the documents only once in each copying circulation of the document set onto one side of copy sheets to form a duplexing buffer and copying other documents onto the oposite sides of the buffer copies to form duplex precollated copies, the improvement comprising:

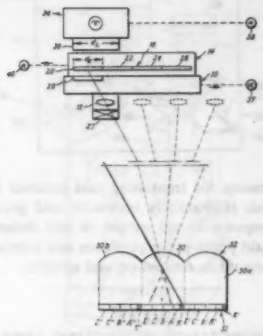
counting the number of documents in the document set and determining that said number of documents is only two or three,

in response to said determination, automatically switching the mode of copying of said documents to a higher productivity three document set mode in which a pre-set limited plural number of identical consecutive copies are made from one of the three documents by halting the first copying circulation of the document set to plurally copy only said one document, and forming said buffer from said plural identical copies made from said one document to form plural identical buffer sets each consisting of one identical sheet, and then skipping the copying of said same one document in the subsequent production of a number of copy sheet sets corresponding to the number of said plural identical copies.

4,468,115
TRAVELLING LAMP HOUSE FOR 3-D PHOTOGRAPHIC PRINTER

Kenneth Q. H. Lao, Atlanta, Ga., assignor to Nimslo International Limited, Hamilton, Bermuda

Filed May 26, 1982, Ser. No. 382,197
Int. Cl.³ G03B 27/32, 35/14
U.S. Cl. 355—22 9 Claims



1. In apparatus for composing a stereoscopic picture of the type including a multiplicity of image bands, each of said image bands comprising a plurality N of condensed image segments from a corresponding plurality N of two-dimensional views of an object field taken from spaced vantage points, and a lenticular screen having a corresponding multiplicity of lenticules aligned with the image bands, said apparatus comprising a projecting lens with a light gate in registry therewith, film holder means for positioning sequentially negatives in a negative film strip series, containing said N two-dimensional views, in said light gate, drive means for moving said lens, at a first preselected speed, in a direction for projecting respective negatives from a corresponding plurality N of projecting lens locations, with the projected image of a selected element of each negative in substantial registry with a reference point, and for stopping said lens at each said lens location for positioning a successive negative in said series in said light gate, and illuminating means for exposing, at each lens location, the respective negative in said light gate for projecting the negative onto a segment of an image band of lenticular print film, the improvement wherein said illuminating means comprises a light cone for directing light through a negative in said light gate and said lens onto said print film, and means for moving said light cone in said direction continuously at a second preselected speed through sequential projecting of all the negatives in said series for illuminating each negative during projection onto its respective segment, wherein said second preselected speed is determined, and said light cone has a width in said direction that is determined, as a function of the operating characteristics of the printer.

6. In a method for composing stereoscopic pictures from a negative film strip series containing a plurality N of two-dimensional views of an object field taken from spaced vantage points, comprising the steps of:

positioning a first negative of said film strip series in a light gate having a projecting lens in registry therewith;

moving said lens, at a preselected first speed, in a direction for projecting respective negatives from a corresponding plurality N of projecting lens locations, with the projected image of a selected element of each negative in substantial registry with a reference point;

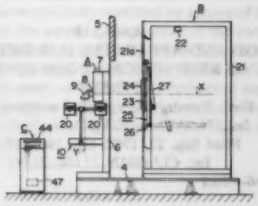
stopping said lens at each said lens location and positioning a successive negative in said series in said light gate; and

moving a light source with said light gate for projecting the respective negative at each lens location through said lens onto a segment of lenticular print film; the improvement comprising moving said light source in said direction continuously at a preselected second speed through sequential projecting of all the negatives in said series for illuminating each negative during projection onto its respective segment, and directing light from said light source to said light gate through a light cone having a width in said direction that is determined, along with said preselected second speed, as a function of the operating characteristics of the printer.

4,468,116
PROCESS CAMERA FOR PRINTING PICTURES OF DIFFERENT SIZES IN THE DESIRED DISPLAY POSITIONS

Eiji Miyasaka, Hikone, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed May 7, 1982, Ser. No. 376,005
Claims priority, application Japan, Jul. 2, 1981, 56-102284
Int. Cl.³ G03B 17/20
U.S. Cl. 355—54 4 Claims



1. A process camera for printing pictures of different sizes in the desired display positions on a photosensitive materials, comprising:

(a) an object holder on which an object to be photographed is mounted and which includes a light for illuminating the object;

(b) a photosensitive material holder on which a photosensitive material is mounted;

(c) a lens holder for holding a lens which focuses the object onto the photosensitive material, wherein these three holders are aligned in series on and along a light axis of the lens, wherein the lens holder is positioned between the object holder and the photosensitive material holder, wherein the object holder is movable towards and away from the lens holder, and wherein the photosensitive material holder is movable in x and y directions perpendicular to the light axis; and

(d) a plurality of register pins and respective drive means for positioning the objects of different sizes, which are mounted to the object holder so that each of the register pins may be independently projected through or beyond the object holder by the respective drive means.

4,468,117
INTEGRATED OPTICAL FIBER TESTING DEVICE

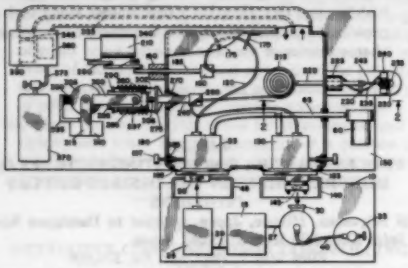
Edward Hartouni, Claremont, and Craig R. Duda, San Dimas, both of Calif., assignors to General Dynamics, Pomona, Calif.

Filed Feb. 22, 1982, Ser. No. 351,062
Int. Cl.³ G01N 21/84, 21/88
U.S. Cl. 356—73.1 16 Claims

15. The method of testing a fiber optic cable comprising the steps in one integrated operation of:

measuring light transmission through the cable;

vibrating said fiber optic cable;
imparting shock to said fiber optic cable;
flexing said fiber optic cable;



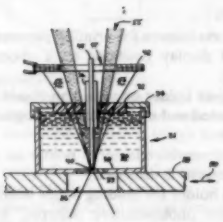
twisting said fiber optic cable; and imparting a tensile load on said fiber optic cable.

4,468,118

METHOD AND APPARATUS FOR DETERMINING INDEX OF REFRACTION PROFILES OF OPTICAL FIBERS

Chester L. Bice, Powder Springs, Ga., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 17, 1982, Ser. No. 419,645
Int. Cl.³ G01N *21/84, 21/41*
U.S. Cl. 356—73.1 **9 Claims**



1. The method of determining the index of refraction profile of an optical fiber comprising the steps of positioning an end of the fiber adjacent a photodetector having a passageway therethrough, diametrically scanning the fiber end with a beam of light passed through an end portion of the fiber and partially onto the photodetector about the passageway and partially through the photodetector passageway, and deriving the index of refraction profile of the fiber in direct proportion to the power of light sensed by the photodetector as the light beam diametrically scans the fiber end.

4,468,119

PENTA-PRISM MODULE HAVING LASER ALIGNMENT ERROR DETECTION AND CORRECTION CAPABILITY

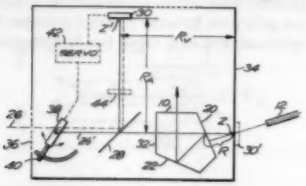
Martin R. Hamar, 70 Linden Tree Rd., Wilton, Conn. 06897

Filed May 24, 1982, Ser. No. 381,079
The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.
Int. Cl.³ G01B *11/26*; G02B *7/18*; G01C *9/02*
U.S. Cl. 356—152 **23 Claims**

1. Apparatus for generating a substantially flat optical plane substantially perpendicular to an incident laser beam from a laser source comprising:

a penta-prism adapted to be mounted on a spindle approximately a predetermined distance from a predetermined point on the axis of rotation of said spindle;

detector means disposed between said laser source and said penta-prism and operative for determining whether the axis of said incident laser beam intersects said predetermined point; and



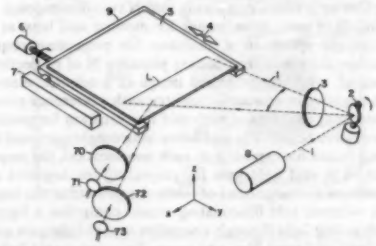
adjustment means for translating said incident laser beam until its axis substantially intersects said predetermined point in response to the output of said detector means, whereby said penta-prism produces said substantially flat optical plane when rotated on said spindle.

4,468,120

FOREIGN SUBSTANCE INSPECTING APPARATUS

Akikazu Tanimoto, Kawasaki, and Kazunori Imamura, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,552
Claims priority, application Japan, Feb. 4, 1981, 56-14387; Oct. 9, 1981, 56-161440; Oct. 9, 1981, 56-161441
Int. Cl.³ G01N *21/00*
U.S. Cl. 356—237 **18 Claims**



1. An apparatus for detecting the presence of a foreign substance adhering to a planar substrate having a light-transmitting property, comprising:

(a) irradiating means capable of emitting a light beam incident on one surface of said substrate obliquely relative to said surface;

(b) means for displacing said irradiating means and said substrate relative to each other so that the position of incidence of said light beam onto said substrate is scanned on said one surface;

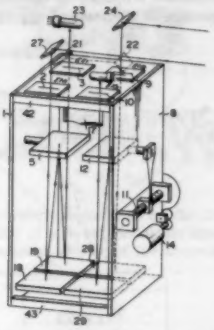
(c) metering means capable of receiving a plurality of irregular reflected light beams irregularly reflected toward different directions by the foreign substance on said surface and producing a plurality of electrical outputs corresponding to the intensities of light of said plurality of irregular reflected light beams, said metering means including first light-receiving means disposed in opposed relationship with said one surface of said substrate and second light-receiving means disposed in opposed relationship with the other surface of said substrate; and

(d) means for deciding the presence of said foreign substance on the basis of said plurality of electrical outputs.

4,468,121
SPECTROPHOTOMETRIC ANALYZER HAVING DUAL MONOCHROMATORS

Hideaki Koizumi, Tokyo, and Konosuke Oishi, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,381
Claims priority, application Japan, Mar. 31, 1981, 56-46462
Int. Cl.³ G01J 3/18
U.S. Cl. 356—328 7 Claims



1. A spectrophotometric analyzer comprising:

a light source;

first and second monochromators capable of operating independently of each other and each having an entrance slit to which a light beam from said light source is made to be incident, means for scanning wavelength by dispersing said light beam which has entered said entrance slit, and an exit slit through which a light beam coming out from said dispersion/scanning means is issued, said entrance and exit slits of said first monochromator and said entrance and exit slits of said second monochromator being disposed rotation symmetrically with respect to a center axis;

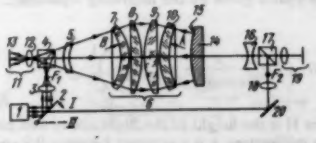
first and second detectors for detecting analyzed light beams from said first and second monochromators respectively;

and a switching means for selecting and setting one of a parallel mode where said first and second monochromators are operated independently for detection and a series mode where the analyzed light beam from said exit slit of said first monochromator is made to be incident on said entrance slit of said second monochromator.

4,468,122
INTERFEROMETER FOR CHECKING THE SHAPE OF CONVEX SURFACES OF OPTICAL COMPONENTS

Daniil T. Puryaev, Moscow, U.S.S.R., assignor to Vysshee Voennoe Tekhnicheskoe Uchilische Imeni N.E. Baumana, Moscow, U.S.S.R.

PCT No. PCT/SU80/00012, § 371 Date Sep. 1, 1981, § 102(e) Date Sep. 1, 1981, PCT Pub. No. WO81/02199, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 30, 1980, Ser. No. 299,027
Int. Cl.³ G01B 9/02
U.S. Cl. 356—360 4 Claims

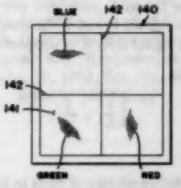


1. An interferometer for checking the shape of convex surfaces of optical components, comprising: a monochromatic light source and a first sequence of devices defining a first optical path arranged therebehind in the path of light beams from said light source, including a first focusing lens, a first light splitter for angularly shifting part of the light from said first focusing lens and for permitting transmission therethrough of reflections of said light from a reference surface, a first compensator, a lens system having a first reference concave spherical surface with a center of curvature optically matched with the back focus of the focusing lens by means of the compensator, and first recording means for recording an interference pattern obtained upon reflection of light beams from the first reference surface through said lens system; a second sequence of devices provided on the other side of said lens system and in the path of light beams from said light source to define a second optical path, including a second compensator, a second light splitter for angularly shifting part of the light from said second focusing lens and for permitting transmission therethrough of reflections of said light from another surface, a second focusing lens, a second reference concave spherical surface, and means for selectively directing light beams from the monochromatic light source to the first focusing lens and to the second focusing lens, said second lens having its back focus optically matched by means of the second compensator with the center of curvature of the second reference concave spherical surface, said first reference concave spherical surface having a radius of curvature different from the radius of curvature of said second reference surface, and second recording means for recording an interference pattern obtained upon reflection of light beams from the second reference surface.

4,468,123
METHOD AND APPARATUS FOR ASCERTAINING COLOR BALANCE OF PHOTOGRAPHIC PRINTING PAPER

Bertram W. Miller, Apartado Postal 316, Chapala, Jalisco 45900, Mexico

Filed May 26, 1982, Ser. No. 382,254
Int. Cl.³ G01J 3/46; G03B 27/04
U.S. Cl. 356—404 12 Claims



4. A method for ascertaining the color balance of color photographic printing paper of the type having three superimposed light-sensitive emulsion layers, each of which is selectively responsive to a different primary color of light, comprising the steps:

(a) making three successive exposures of the same portion of a sample sheet of printing paper, one exposure being made directly on the paper and the other two being made through an optical wedge of linear density gradient, each of the three exposures consisting essentially of a different primary color of light of predetermined intensity and duration;

(b) developing the sample sheet of printing paper to produce a composite image representing the combined response of the three emulsion layers; and

(c) measuring the linear displacements of a selected area on the composite print corresponding to a neutral gray from a pair of axes.

4,468,124

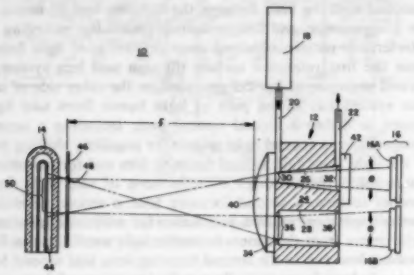
DOUBLE BEAM PHOTOMETER FOR MEASURING FLUID SAMPLES

Alan C. Berick, Albany, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 235,253, Feb. 17, 1981, abandoned. This application May 10, 1983, Ser. No. 493,395

Int. Cl.³ G01N *21/85*

U.S. Cl. 356—411 **3 Claims**



1. A method of operating a double beam flow cell photometer of the type comprising a light source, means defining sample and reference light beam paths configured to receive light from the source and pass the light therealong and through a fluid sample in the sample beam path, means for flowing fluid samples into and from the path of the sample beam, said method including the steps of:

positioning first and second detectors proximate one another in the respective sample and reference beam paths and subject to the same environment for measuring the relative intensity of the sample and reference beams upon emergence from the beam paths;

directing light from the source along the beam paths toward the first and second detectors to derive an output signal providing a measure of the effect of the fluid sample on the sample light beam, the output signal including a shot noise signal component;

generating respective sample and reference beam output current signals I_s and I_r such that for the ratio R of the output current signals I_s and I_r the total fluctuation of the ratioed output signal $\Delta R/R$ is proportional to

$$\sqrt{\frac{1}{I_s}+\frac{1}{I_r}}\,;$$

and

regulating the relative energy of light in the beam paths such that the energy in the reference beam path exceeds that in the sample beam path whereby the output current signal I_r exceeds output current signal I_s so that the contribution of the reference beam to the output shot noise level is reduced.

4,468,125

METHOD AND APPARATUS FOR THE BATCHWISE PRODUCTION OF PAVING MIXES CONTAINING MINERAL AGGREGATE AND BITUMINOUS BINDER

Karl G. Ohlson, Postlåda 9073, S-281 00 Hässleholm, Sweden

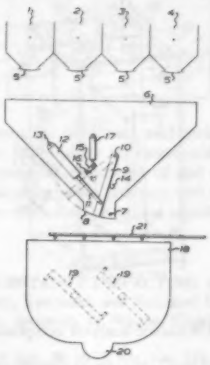
Filed Jul. 20, 1981, Ser. No. 285,228

Claims priority, application Sweden, Aug. 1, 1980, 800550

Int. Cl.³ B28C *7/04*

U.S. Cl. 366—8 **2 Claims**

2. A method for the batchwise production of a paving mix which contains a batch of mineral aggregate with different sizes of particles and a batch of bituminous binder by first introducing into a container having a discharge opening with openable discharge door means a coarse-grained portion of the mineral aggregate batch in measured quantity and then opening the door means for discharging the measured, coarse-grained portion through the discharge opening of the container into a continuously operating asphalt mixer in which the coarse-grained portion of the mineral aggregate batch is mixed with the entire binder batch, while the remaining fine-grained portion of the mineral aggregate batch is introduced into the container in measured quantity, whereupon the discharge door means of the container is opened for discharging the measured, fine-grained portion of the mineral aggregate batch through



the discharge opening of the container into the mixer and finally the mixer is emptied after a certain time of admixture of the fine-grained portion of the mineral aggregate batch, characterized by controlling the admixing of the fine-grained portion of the mineral aggregate and controlling the time needed for discharging the fine-grained portion of the mineral aggregate batch into the mixer by controlling the degree to which the discharge door means of the container is opened when the fine-grained portion of the mineral aggregate batch is discharged from the container, whereby temporary build-up of said fine-grained portion on top of the composition being mixed in said mixer is substantially prevented.

4,468,126

HIGH EFFICIENCY SCREW FEEDERS FOR CONTINUOUS EXTRUSION AND REFINING OF SOAPS, DETERGENTS AND OTHER SIMILAR PLASTIC PRODUCTS

Guido Mazzoni, Busto Arsizio, Italy, assignor to Costruzioni Meccaniche G. Mazzoni S.p.A, Busto Arsizio, Italy

Filed May 26, 1981, Ser. No. 267,296

Claims priority, application Italy, Jun. 5, 1980, 22574 A/80

Int. Cl.³ B29B *1/06*

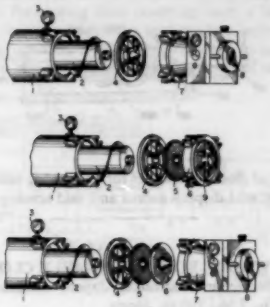
U.S. Cl. 366—87 **6 Claims**

1. A screw feeder for extruding pasty materials, comprising a casing, and means for moving pasty materials through the casing, said moving means comprising a core having a portion of constant diameter and a helical flight on the core, and an extruding die through which the helical flight forces the pasty material to extrude it into a bar, said moving means having characteristics given by the following equation:

$$H = k \times \frac{A}{(\sin\phi)^4} \times \left(\frac{L2}{D}\right)^4$$

wherein H is the height of the flight above said portion of the core in millimeters, k is a constant between 0.9 and 1.8, L2/D is the ratio of the length of said portion of constant diameter to the external diameter of the flight, ϕ is the angle formed by the

flight pitch and is between 15° and 25°, and A is $(-2701.16+853.85\times \ln b)^{\frac{1}{2}}$, wherein b is the equivalent diameter in millimeters of the extruded bar and ln is the natural



logarithm, said equivalent diameter being the diameter of the circular right section of a hypothetical bar having the same area of the right section as that of the cross section of the extruded bar.

4,468,127

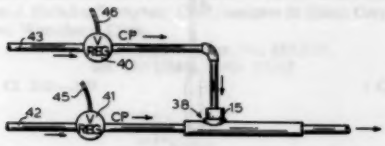
PROCESS FOR METERING AND MIXING LIQUIDS IN ARBITRARY MASS PROPORTIONS

Vito Agosta, 42 Cherry La., Huntington, N.Y. 11743

Continuation of Ser. No. 183,216, Sep. 2, 1980, abandoned. This application Aug. 26, 1982, Ser. No. 411,851

Int. Cl.³ B01F *5/00*

U.S. Cl. 366—150 **7 Claims**



1. The method of obtaining a variable mixture of a primary liquid and secondary liquid in a predetermined proportional locus while the stagnation pressure and/or mass flow of the primary liquid vary comprising only the steps of:

(a) decreasing the pressure of the primary liquid by passing it through a passive device having a passageway therein including a first section having a decreasing cross sectional area and a second section of substantially constant cross sectional area equal to the minimum cross sectional area of said first section; and

(b) introducing the secondary liquid into the passive device at the second section.

4,468,128

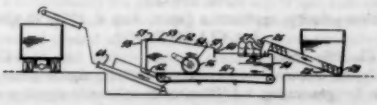
CONTINUOUS CONVEYOR COMPOSTER METHOD AND APPARATUS

Herbert T. Cobey, P.O. Box 226, Iberia, Ohio 43325

Filed Nov. 23, 1981, Ser. No. 323,918

Int. Cl.³ B01F *5/00*

U.S. Cl. 366—156 **11 Claims**



1. A conveyor composting apparatus for continuously mixing sewage sludge, compost, refuse and other organic material into a porous readily compostable product, said apparatus comprising, in combination:

a first mixing chamber to receive compost, sewage sludge, refuse or other organic material;

means for receiving and transferring organic waste, said means including a compost hopper bin for temporary storage and a screw auger means to transfer said organic waste from said compost hopper bin into said first mixing chamber;

means for accepting and transferring sewage sludge, said means including a sewage sludge hopper bin for temporary storage and a screw auger means to transfer said sewage sludge from said sewage sludge hopper bin into said first mixing chamber;

means for accepting and transferring refuse, said means including a refuse hopper bin for temporary storage and a screw auger means to transfer said refuse from said refuse hopper bin into said first mixing chamber,

said compost hopper bin, said sewage sludge hopper bin and said refuse hopper bin having sidewalls gradually tapering toward the bottom such that they are spaced apart at the bottom a distance substantially equal to the width of the respective screw auger provides means for transporting said materials from the bottom of said hopper bins in an upward angular direction to an area directly above said first mixing chamber and for discharging said materials into said first mixing chamber, said auger means being disposed in the bottom of said respective hopper bins and having screw shaped paddles located at the discharge end of each screw augers to facilitate mixing said compost material;

a second mixing chamber;

means for transferring partially mixed compostable product from said first mixing chamber to said second mixing chamber;

means for further mixing said partially mixed compostable product into a finished compostable product including a compost-throwing member; and

means for removing said finished compostable product from the composting apparatus.

4,468,129

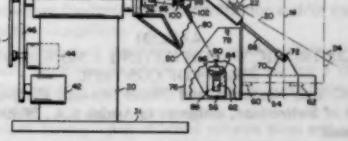
SOLIDS MIXING APPARATUS

George C. McIntosh, Dansville; Jonathan C. Everdyke, Canandaigua, and Marlin D. Schutte, Rochester, all of N.Y., assignors to General Signal Corp., Rochester, N.Y.

Filed May 20, 1983, Ser. No. 496,778

Int. Cl.³ B01F *9/02*

U.S. Cl. 366—213 **43 Claims**



1. Solids mixing apparatus comprising portable containers in which the solids to be mixed are carried and in which a mixing bar is rotatably mounted, said container having a longitudinal axis extending between the top and bottom thereof and said mixing bar being disposed at an angle of less than 90° with respect to said longitudinal axis, a mixing station in which said containers are individually received and rotated with asymmetrical motion of the longitudinal axis thereof about a hori-

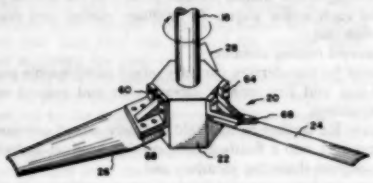
zontal axis, said station having first and second drive shafts rotatable about a horizontal axis, a frame attached to said first drive shaft having a member disposed at said angle with a fixed upper arm presenting a first clamping surface and a lower arm moveably connected to said member and presenting a second clamping surface, means mounting said lower arm to said member to provide compound tilting and translational movement of said second clamping surface between the horizontal and a position paralleling said first clamping surface and in the direction along said member whereby the container can be received upon said second clamping surface while horizontal, tilted and translated into clamping relationship with said first and second clamping surfaces, and coupling means having interengageable male and female members, one of which is connected to said mixing bar and the other to said second drive shaft, said members having mating drive surfaces rectilinear in cross-section, said coupling means also having means mounting one of said interengageable members as a detent for enabling said drive surfaces to align and engage each other in driving relationship upon initiation of rotation of said second shaft.

4,468,130

MIXING APPARATUS

Ronald J. Weetman, Rochester, N.Y., assignor to General Signal Corp., Rochester, N.Y.

Filed Nov. 4, 1981, Ser. No. 318,170
Int. Cl.³ B01F 7/20
U.S. Cl. 366—330 **23 Claims**



1. For use in mixing a liquid or a liquid suspension medium contained in a vessel, impeller apparatus which comprises an impeller, a shaft having an axis mounting said impeller in said vessel below the level of said medium, a plurality of blades mounted on said shaft for rotation about said axis, each of said blades being formed of a plate of constant thickness except for rounded profile along its leading edge in the direction of flow of the medium and a camber which decreases from the tip of the blade at its outer end to a region adjacent to the base of said blade, each blade also having a geometric pitch angle which increases from the tip to the base thereof and which is at the threshold for flow separation from the surface of said blade along the width thereof from the leading to the trailing edge thereof, such that maximum flow in the direction axially of said shaft is obtained before the onset of said separation.

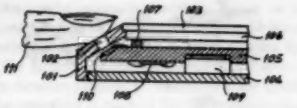
4,468,131

ELECTRONIC WATCH HAVING A NON-MOVING MEANS OF CONTROL

Ngoc C. Bui, Neuchatel, and Daniel Simonet, Perly-Certoux, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed May 3, 1982, Ser. No. 374,018
Int. Cl.³ G04C 17/00; G04B 19/00
U.S. Cl. 368—69 **13 Claims**

1. An electronic watch comprising:
a case having a transparent window therein;
photo-electric sensing means located behind said transparent window, within said case, and operably positioned to receive ambient light for producing control signals when said window is obstructed by a finger or the like;
a timekeeping circuit connected to receive said control signals;
time display means controlled by said timekeeping circuit; and



a source of electrical power for energizing said time-keeping circuit, said display means and said sensing means.

4,468,132

WHOLE BODY SWINGABLE CLOCK

Norihiko Nakamura, Saitama, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1983, Ser. No. 487,100
Claims priority, application Japan, Apr. 26, 1982, 57-69815; Apr. 26, 1982, 57-69816
Int. Cl.³ G04B 19/00; G04C 23/02
U.S. Cl. 368—76 **3 Claims**

1. A whole body swingable clock comprising: a clock body swingably supported on a pendulum fulcrum and solidly secured thereto with a clock mechanism case housing therein a movement case; and a stationary receiving plate provided thereon with a magnet or a driving coil to be electromagnetically connected to a driving coil or a magnet provided on said movement case for generating a swinging driving force in said clock body; wherein the stationary receiving plate with the magnet or the driving coil is housed in a space formed in said movement case, whereby said clock body can swing with the stationary receiving plate with the magnet or the driving coil being hardly exposed to outside from said clock body.

4,468,133

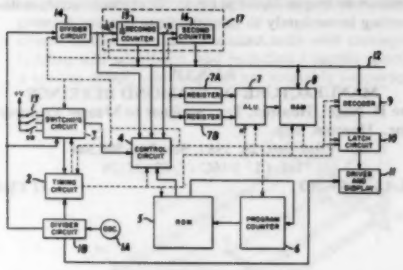
ELECTRONIC TIMEPIECE

Seiko Sasaki, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Continuation of Ser. No. 399,747, Jul. 19, 1982, abandoned, which is a continuation of Ser. No. 75,893, Sep. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 927,363, Jul. 24, 1978, abandoned. This application Jan. 31, 1984, Ser. No. 575,485
Claims priority, application Japan, Aug. 4, 1977, 52-93665
Int. Cl.³ G04F 5/00
U.S. Cl. 368—156 **4 Claims**

1. In an electronic timepiece: reference signal generating means for generating a 1/10 seconds reference signal; a static counter connected to said reference signal generating means for counting at least the 1/10 seconds reference signal and

producing a reference count signal; a read only memory for storing a system program which executes and controls a time count; an arithmetic and logic unit for executing the time count; a random access memory connected to said arithmetic and logic unit for storing time counting data; a bidirectional data bus line connected between said random access memory and said static counter; a decoder connected to said bidirectional data bus line for decoding the contents of said random



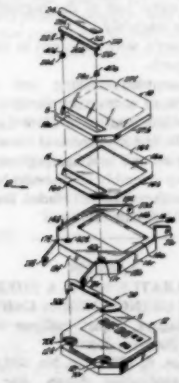
access memory and said static counter and providing corresponding decoded time data signals; display means responsive to the decoded time data signals for indicating the contents of said random access memory and said static counter; and control means connected to said read only memory and coacting therewith for initiating the actions of said random access memory and said arithmetic and logic unit in response to the reference count signal from said static counter.

4,468,134

WATCH BEZEL/LENS/ROCKER SWITCH ASSEMBLY

James J. Halicho, Sunnyvale, Calif., assignor to Timex Corporation, Waterbury, Conn.

Filed Jun. 10, 1982, Ser. No. 387,069
Int. Cl.³ G04B *37/00, 27/02*
U.S. Cl. 368—309 **1 Claim**



1. In a timepiece including a case and a module with time display means and switch contact means inside said case, the combination of:

(a) a substantially flat platform on the top of said case including an aperture for viewing said time display means and a pair of spaced apart holes in said platform providing access to said switch contact means inside said case, said platform being defined by frame members extending along opposite sides thereof forming an open-ended platform recess therebetween,

(b) a crystal member having a substantially flat side disposed over substantially the entire surface area of said platform between said frame members, said crystal having at least one opening therein surrounding said holes, thereby defining at least one crystal recess with said holes in the bottom thereof,

(c) doubly coated adhesive gasket disposed in the area between the crystal and the platform attaching the same together and sealing against moisture entry into said case,

(d) a manually-operable actuator bar, free from contact with said crystal member, disposed in and projecting through said crystal recess having an accessible top side by which said bar can be manually pressed and having a second side spaced from and facing the platform at the bottom of said recess, and having a pair of legs projecting from said second side through said holes, such that at least one leg is urged into direct contact with said switch contact means by pressing said bar without exerting force on said crystal member,

(e) retaining means cooperating with each leg and said platform for retaining said bar in said crystal recess, and

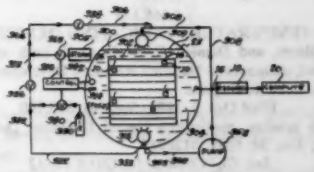
(f) resilient washer means disposed around each leg between the second side of said actuator bar and the platform at the bottom of said recess with portions of the washer means in contact with said second side and the platform in said recess bottom to provide sealing action and return-spring action for the actuator bar.

4,468,135

RETORT POUCH THERMAL SIMULATOR AND METHOD OF OPTIMIZING HEAT TRANSFER IN RETORT CONDITIONS

George R. McCain, Northbrook, and Philip H. Blaetz, Barrington, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Feb. 1, 1983, Ser. No. 462,939
Int. Cl.³ G01K *1/02, 13/00*
U.S. Cl. 374—44 **11 Claims**



1. A simulator of thermal diffusivity of a flexible retort pouch containing a food product, which simulator is useful for measuring heat transfer at various locations within a retort chamber where food is heated for sterilization and/or cooking, the simulator comprising,

a block formed of material that is stable within the wet, heated environment of the retort and having a thermal diffusivity of between about 0.005 in^2min. and about 0.20 in^2/min.

said block having a pair of broad exterior faces and a thickness as measured between said exterior faces substantially equal to the thickness of a food-filled retort pouch and lateral and longitudinal dimensions substantially greater than the thickness,

a thermal sensor embedded in said block precisely centered midway between said exterior faces, and

electrical leads extending from said sensor externally of said block, said leads being connectable to a temperature recording device.

4,468,136

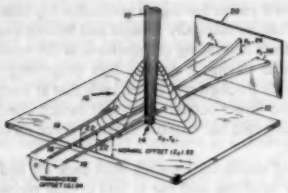
OPTICAL BEAM DEFLECTION THERMAL IMAGING

John C. Murphy, Columbia, and Leonard C. Aamodt, Silver Spring, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Feb. 12, 1982, Ser. No. 348,369

Int. Cl.[3] **G01N** *21/00, 25/00*

U.S. Cl. 374—45 **46 Claims**



1. An apparatus for the nondestructive testing of material, comprising:

a narrow beam excitation means for generating a spatially localized area on the sample surface having a radial surface temperature gradient;

a narrow optical probe beam directed through at least one of a plurality of positions, each position having a different transverse offset value (Δ) measured from the point of intersection with said narrow beam excitation means, and passing through a thermal lens produced adjacent to said sample by said radial surface temperature gradient; and,

an optical detecting means for measuring the transverse deflection (ψ_t) of said narrow optical probe beam for said at least one of a plurality of transverse offset valves (Δ) thereby providing information as to the shape of said thermal lens which in turn indicates properties and features at the surface and subsurface layers of said sample.

4,468,137

TEMPERATURE INDICATING DEVICES

Cyril Hilsum, and Damien G. McDonnell, both of Malvern, England, assignors to National Research Development Corporation, London, England

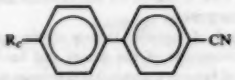
Filed Oct. 5, 1981, Ser. No. 308,790

Claims priority, application United Kingdom, Oct. 7, 1980, 8032280; Jun. 30, 1981, 8120215

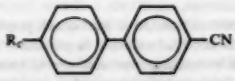
Int. Cl.[3] **C09K** *3/34;* **G01K** *11/12*

U.S. Cl. 374—160 **8 Claims**

1. A temperature indicating device comprising a series of liquid crystal cells each being free of cholesteryl compounds and containing (1) a cyanobiphenyl compound having the formula



where R_c is (+)-2-methylbutyl, (2) a nematic liquid crystal material which is liquid crystalline at room temperature (20° C.) including a compound of the formula



where R_c is (±)-2-methyl butyl and (3) a liquid crystal material having a clearing point above 100° C., said cyanobiphenyl compounds being present in different concentrations in different cells whereby said cyanobiphenyl compounds selectively reflect light of the same color in the grandjean state at temperatures below their respective temperature clearing points, but have different clearing points varying stepwise from cell-to-cell to indicate temperature by iridescence of the cells, each cell undergoing, on cooling from the isotropic liquid state, the transition isotropic liquid state to focal conic state, without reverting immediately to the grandjean state.

4,468,138

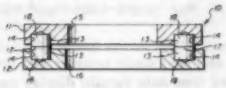
MANUFACTURE OF DIAMOND BEARINGS

Dave D. Nagel, Houston, Tex., assignor to Maurer Engineering Inc., Houston, Tex.

Filed Sep. 28, 1981, Ser. No. 306,544

Int. Cl.[3] **F16C** *17/02, 33/26*

U.S. Cl. 384—303 **11 Claims**



1. In a method of producing diamond faced bearings comprising

an annular supporting plate or ring having a plurality of recesses spaced uniformly therearound,

a plurality of diamond faced insert members positioned one in each of said recesses,

said insert members comprising a right cylindrical supporting stud of hardmetal having an end face of polycrystalline diamond,

said recesses being of substantially uniform depth to position said diamond faces substantially in a common plane, the improvement which comprises

placing a fusible metal pad in the bottom of each of said recesses prior to assembly,

positioning said inserts with the studs in said recesses abutting said metal pads,

inverting the assembled bearing and positioning said diamond faces on an accurately planar support,

heating the assembled bearing while on said support to a temperature sufficient to cause said metal pads to extrude at least partially around said bearing insert studs, and

cooling said bearing assembly so that said bearing inserts are supported with the diamond faces thereof accurately positioned in a co-planar relation.

4,468,139

PRINTING APPARATUS WITH A THERMAL PRINT HEAD INCLUDING RIBBON CARTRIDGE

Shigenori Hattori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 6, 1983, Ser. No. 482,425

Claims priority, application Japan, Apr. 12, 1982, 57-52946[U]

Int. Cl.[3] **B41J** *3/02*

U.S. Cl. 400—120 **16 Claims**

1. A printing apparatus using an ink ribbon having a layer in ink thermally transferable to a printing surface of a sheet of paper, which comprises:

paper support means for holding said sheet of paper;

a thermal print head having a plurality of selectively activated heat generating elements;

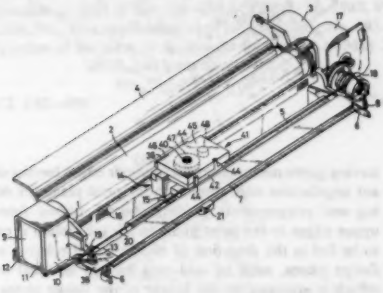
a carriage carrying said thermal print head, movable along a line of printing on said paper support means, and pivotable between its printing position and its release position about

an axis parallel to said line of printing, said carriage forcing said thermal print head against said printing surface of the sheet of paper while the carriage is placed in said printing position, said thermal print head being spaced from said printing surface while said carriage is placed in said release position;

first drive means for moving said carriage along said line of printing;

second drive means for pivoting said carriage between said printing and release positions;

a ribbon holding device associated with said carriage for holding said ink ribbon, and including a supply spool and a take-up spool, which spools are rotatably supported by



said carriage, a length of said ink ribbon looped out of said ribbon holding device and nipped between said sheet of paper and said thermal print head being fed in contact with the sheet of paper relative to said ribbon holding device while said carriage placed in said printing position is moved relative to the sheet of paper, and re-wound on said take-up spool;

a stationary rack extending along said line of printing; and

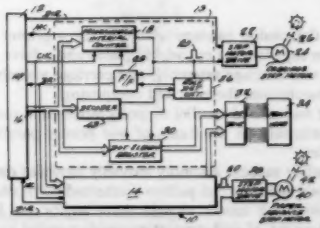
a pinion rotatably supported on said carriage and operatively connected to said take-up spool, said pinion engaging said rack to rotate said take-up spool while said carriage is placed in said printing position, and disengaging from said rack when the carriage is pivoted to said release position.

4,468,140

METHOD AND APPARATUS FOR COORDINATED CONTROL OF DOT MATRIX PRINTER HEAD AND CARRIAGE

Samuel C. Harris, Waynesboro, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Jul. 16, 1982, Ser. No. 399,130
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **24 Claims**



1. A dot matrix printer control circuit for coordinated control of the motion of a print head carriage and of the printing action of a dot matrix print head carried thereby, said control circuit comprising:

control means for periodically generating a motion control signal corresponding to a predetermined increment of carriage motion;

carriage drive means including a step motor connected to receive said motion control signal and to move said carriage by said predetermined increment in response thereto; and

print head drive means for activating the dot matrix print head to effect printing action in accordance with print data received in response to an occurrence of said motion control signal;

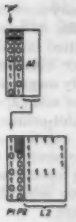
said carriage drive means including flight-time delay means for producing step motor drive pulses in delayed response to said motion control signals, the time duration of delay being predetermined to compensate for the time required by said print head to effect a printing action after activation thereof in response to said motion control signal.

4,468,141

CHARACTER GENERATOR

Kalman Rosza, Järfälla, Sweden, assignor to Facit Aktiebolag, Åtvidaberg, Sweden

PCT No. PCT/SE81/00370, § 371 Date Aug. 18, 1982, § 102(e) Date Aug. 18, 1982, PCT Pub. No. WO82/02269, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 14, 1981, Ser. No. 413,363
Claims priority, application Sweden, Dec. 19, 1980, 8009036
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **5 Claims**



1. A character generator for a dot matrix printing head of the type having at least nine printing needles in a column, comprising:

a first memory unit containing information for each character relating to (a) the total number of columns corresponding to the length of the character, (b) the number of such columns in which printing needles are to be activated, and (c) whether the ninth printing needle is to be activated for the character;

a second memory unit storing a graphic representation of the characters and having, for each character, a first section containing a number of information bits corresponding to the number of columns in the character with each information bit indicating whether a needle is to be activated in an associated column, a second section containing information on which of the first eight printing needles of the printing head are to be activated in each column identified in the first section as having an activated needle, and a third section having a number of information bits equal to the number of information bits in said first section when information (c) in the first memory unit indicates that the character requires a ninth needle, the information bits in said third section identifying the columns of the character in which the ninth needle is to be activated; and

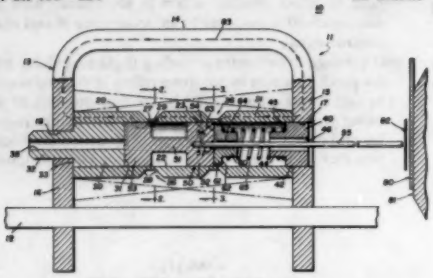
means for reading the information stored in said first and second memory units and applying it to the printing head.

4,468,142

PINT WIRE ACTUATOR

Harry R. Berrey, Waynesboro, and Paul W. Caulier, Greenwood, both of Va., assignors to Genicom Corporation, Waynesboro, Va.

Filed Nov. 12, 1982, Ser. No. 440,811
Int. Cl.³ B41J *3/12*
U.S. Cl. 400—124 **16 Claims**



1. A solenoid-type print wire actuator for use in a dot-matrix printer, said actuator comprising:

a one-piece magnetically permeable cylinder member having an internal cylindrical aperture and forming part of an annular magnetic circuit along its axial direction;

said one-piece cylinder member having a plurality of spaced-apart annular grooves formed into its external surface so as to provide a corresponding plurality of magnetically saturable annular gaps in the magnetic circuit;

an electrical drive coil means electromagnetically linked to said magnetic circuit;

a one-piece magnetically permeable armature member having a similar plurality of spaced-apart cylindrical piston portions slidingly fitted into the internal cylindrical aperture of the one-piece cylinder member, each said piston portion progressively magnetically bridging a respectfully corresponding one of said gaps as said armature member is axially moved in a dot-printing action; and

spring biasing means exerting a spring bias force on said armature member to position it, in the absence of an electromagnetic driving force from said drive coil means, to a nominal rest position whereat said piston portions partially bridge said gaps.

4,468,143

DEVICE FOR THE MOUNTING OF A PRINTING HEAD AND FOR THE MOUNTING AND GUIDANCE OF AN INK RIBBON FOR A PRINTER

Hans-Werner Volke, Salzkotten; Jürgen Hilkenmeier, Paderborn; Hermann Kohlhage, Paderborn, and Udo Tewes, Paderborn, all of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,545
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214633
Int. Cl.³ B41J *35/06, 32/02*
U.S. Cl. 400—248 **4 Claims**

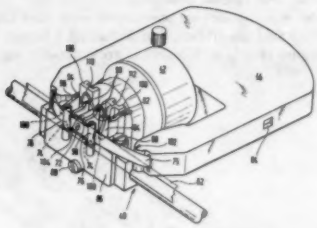
1. Apparatus for receiving and locating a printer ink ribbon cartridge and a printer element relative to a print plane through which the ribbon runs in normal operation comprising:

a carrier constructed to receive and hold a printer ink ribbon cartridge and a printer element in operative association with one another and having a head part disposed parallel to and adjacent the print plane;

first locking means on said carrier for receiving and holding said cartridge in place;

second locking means on said carrier for receiving and holding said printer element in place;

a plurality of flange plates disposed on said head part in parallel spaced relationship and having parallel front ink ribbon guide edges, a pair of pins disposed in parallel spaced apart relationship on said head part, said flange plates and pins being located such that in the direction of ink ribbon travel the ribbon first passes at least one flange plate, and then passes one pin, and then passes at least one more flange plate before passing the second pin and the final flange plate, at least two of said flange plates further



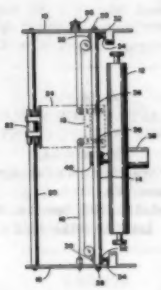
having guide means comprising upper edges having different angularities with respect to the print plane for receiving and progressively guiding the ink ribbon from the upper edges to the print plane as the ink ribbon is caused to be fed in the direction of ribbon travel relative to the flange plates, each of said pins having an axial height which is greater than the height of the flange plates.

4,468,144

DETACHABLE CARRIAGE ASSEMBLY FOR PRINTER

Ronald G. McMahon, and Donnie E. Hale, both of Garland, Tex., assignors to Contitronix, Inc., Garland, Tex.

Filed Jun. 9, 1982, Ser. No. 386,717
Int. Cl.³ B41J *19/00*
U.S. Cl. 400—354 **11 Claims**



1. A detachable carriage assembly for a printer having a frame for supporting a cylindrical platen and a drive motor for moving said carriage assembly, said carriage assembly having a print mechanism thereon, and comprising:

a. first and second parallel supports mounted in spaced apart relationship on the frame of said printer parallel to said platen,

b. a pulley support assembly movably mounted on only one of said supports and pulleys connected by flexible motion transmitting means to said drive motor for horizontal movement of said support assembly parallel to said supports,

c. a bearing assembly slidably mounted on the other of said supports independent of and spaced from said pulley support assembly, and

d. said carriage assembly being coupled between said pulley

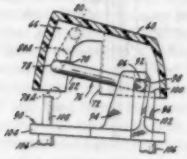
support assembly and said bearing assembly, said carriage assembly being detachably secured to said pulley support assembly and slidably engaging said bearing assembly for moving said carriage assembly horizontally and parallel to said platen as said pulley support assembly moves thereby moving said printer mechanism in a direction parallel to said platen whereby said carriage assembly may be removed from said printer and replaced without adjustments to said pulley support assembly.

4,468,145

KEYBOARD SPACE BAR STABILIZER

Ronald S. Denley, Woodstock, Ill., assignor to Oak Industries, Inc., Rancho Bernardo, Calif.

Continuation-in-part of Ser. No. 359,217, Mar. 18, 1982, Pat. No. 4,384,796. This application May 11, 1983, Ser. No. 493,627
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ B41J *5/08*
U.S. Cl. 400—496 **6 Claims**



1. In a keyboard assembly, a baseplate, a plurality of keys attached to the baseplate, at least one of the keys having an elongated keytop supported by a torsion rod having crank arms, and an attachment element connected directly to the baseplate for connecting the torsion rod to the keyboard assembly, including an enclosure formed in the attachment element, a crank arm being disposed in the enclosure and free to slide therein when the key is actuated, the enclosure being defined by at least one leg having slide surfaces and a spring which flexibly engages the crank arm to secure the crank arm in the enclosure.

4,468,146

CRAYON HOLDER

Joel B. Tabachnik, New York, N.Y., assignor to Talbot Toys Ltd., Wanchai, Hong Kong

Filed May 13, 1982, Ser. No. 377,639
Int. Cl.³ B43K *21/22, 23/00, 23/04*
U.S. Cl. 401—88 **1 Claim**

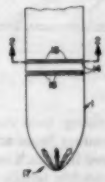
1. A crayon holder comprising:
a hollow generally cylindrical body;
a generally cylindrical collet member having jaws at one longitudinal end capable of flexing radially inwardly and outwardly, said collet member being telescoped and threaded to said body at the other longitudinal end;
a cylindrical sleeve telescoped over at least a portion of each of said collet member and said body, said body including a simulated neck which is connected to a simulated head having a hat, and simulated arm stubs projecting from opposite sides of said neck beyond the circumference of the head and the sleeve, said arm stubs being substantially perpendicular to said body, the lower end of said neck having a radially outwardly extending shoulder acting as a longitudinal limit stop for said sleeve;
means including an axially extending keyway on the outer periphery of said collet member extending through at least a portion of said threads and a key on the inner periphery of said sleeve cooperative with said keyway for moving said collet member longitudinally relative to said sleeve as said body is rotated relative to the sleeve; and
a groove on said body coextensive with said shoulder for receiving a projection on said sleeve to facilitate rotation of the body relative to the sleeve without moving the sleeve in a longitudinal direction, said sleeve having a tapered portion at one end for cooperating with outwardly extending cams on said jaws for camming said jaws inwardly, said jaws having an end surface cooperating with an end surface at the tapered end of the sleeve to provide a stable support area substantially equal to the circumference of the holder so that the crayon holder may stand in an upright vertical position on a support surface when the jaws are positioned inside said sleeve.

4,468,147

WRITING WICK FOR FELT MARKERS OR PENS

Christoph Manusch, Hanover, and Wolfgang Kupferschmidt, Wedemark, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 202,770, Oct. 31, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,026
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1979, 2946094
Int. Cl.³ B43K *1/06*
U.S. Cl. 401—292 **7 Claims**



1. A writing wick having a writing tip portion and a longitudinal central axis and an outer surface for felt markers and pens, comprising an elongate bundle of a plurality of individual monofilament thermoplastic strands defining longitudinal capillary channels between said monofilament thermoplastic strands, said longitudinal capillary channels having radially inner ends spaced from said longitudinal central axis, whereby all of said longitudinal capillary channels are separated and fully closed off from one another inside said wick around said central axis, said longitudinal capillary channels having radially outer ends all of which are substantially uniformly spaced from said outer surface of the wick, whereby the longitudinal capillary channels are outwardly enclosed by said monofilament thermoplastic strands forming an outer skin between said outer surface of the wick and said outer ends of said longitudinal capillary channels, and at least two ring type capillary ducts in said outer skin penetrating from said outer surface inwardly, one of said ring type capillary ducts being located in said bundle sufficiently close to said writing tip of the wick for imparting a certain springiness to the writing tip, both of said ring type capillary ducts extending inwardly to a depth sufficient to operatively interconnect all of said longitudinal capil-

lary channels to one another inside the wick at least at two locations along the wick for positively supplying all longitudinal capillary channels with ink, the other of said capillary ring type ducts being located in said writing tip portion for also aiding in keeping the tip clean when the tip moves due to said springiness.

4,468,148

MEANS FOR REDUCING STRESS OR FRETTING IN CLAMPED ASSEMBLIES

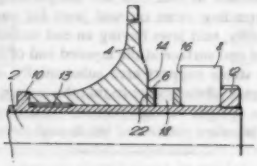
Donald G. Seymour, Bristol, England, assignor to Rolls-Royce Limited, England

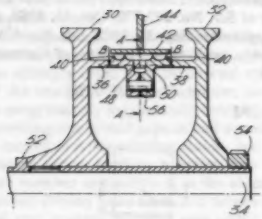
Filed Sep. 15, 1982, Ser. No. 418,423

Claims priority, application United Kingdom, Oct. 28, 1981, 8132524

Int. Cl.³ B25G *3/00*; **F16B** *9/00*; **F16L** *41/00*

U.S. Cl. 403—259 **4 Claims**





1. An assembly comprising: two components clamped together and having confronting faces across which a compressive load is transmitted and in which one or more of the components is subject to a variable tensile stress; and an array of spaced-apart struts which extend in a direction normal to a plane of the confronting faces and which are capable of transmitting a compressive load between the components while allowing flexibility in at least one direction normal to said plane.

4,468,149

ASSEMBLY FOR ANCHORING AN ELEMENT TO A SLAB

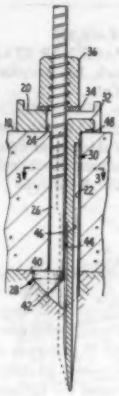
David L. Kelly, Sacramento, and Frank E. Turner, San Mateo, both of Calif., assignors to The Burke Company, San Mateo, Calif.

Filed Feb. 16, 1983, Ser. No. 467,097

Int. Cl.³ F16B *35/04*

U.S. Cl. 403—316 **6 Claims**

1. An improved assembly for anchoring an element to a slab, said assembly comprising: a cylindrical bore formed in the slab; a footplate disposed to one side of the slab and having an aperture in registry with said bore; a threaded anchor bolt removably extending through said aperture and fully through said bore, said bolt having a foot portion of generally circular cross-section, as viewed in a plane normal to the bolt, disposed eccentrically relative to the bolt so as to extend laterally therefrom into underlying relation to the slab, said cross-section being a diameter slightly less than that of the bore to enable emplacement and removal of said bolt through said bore; an anchor bolt wedge spike extending fully through said bore maintain the foot portion in underlying relation to the slab, said spike having an inner surface complementally engaged with the foot portion and bolt, which surface has a longitudinally extending groove to reduce friction between the bolt and



spike, and an outer surface complementally engaged with the bore whereby the spike laterally supports the bolt within the bore and prevents the foot portion from rotating relative to the spike; a right-angled head portion formed on the spike and engaged with the side of the slab opposite that engaged by the foot portion of the bolt, said head portion being disposed within the aperture of the plate; and, a nut bearing against the footplate in removably threaded engagement with the bolt to secure the plate to the bolt.

4,468,150

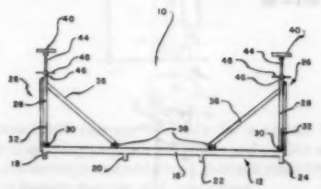
ADJUSTABLE CRADLE FOR SUPPORTING AND STABILIZING BOATS

James W. Price, Rte. 1, Box 87, Grifton, N.C. 28530

Filed Apr. 22, 1982, Ser. No. 370,839

Int. Cl.³ B23Q *3/00*; **B63C** *3/06, 5/05*; **F16M** *13/00*

U.S. Cl. 405—7 **4 Claims**



1. An adjustable boat cradle for stabilizing and supporting boats having hulls of various size and shape, comprising:

A. a base frame structure including two spaced apart longitudinal frame members and a plurality of transverse frame members extending between said longitudinal frame members so as to define four corner areas and wherein said plurality of transverse frame members includes a pair of end-transverse frame members extending between said longitudinal frame members;

B. a plurality of upstanding vertical support assemblies se-

cured at each corner area of said base frame structure and adapted to extend generally upwardly therefrom to engage, stabilize and generally support a boat hull, each vertical support assembly including:

(1.) a generally elongated main support member operatively connected to said base frame structure at a corner area thereof in the vicinity of a respective junction formed by a respective end-transverse member and a longitudinal frame member and extending upwardly therefrom;

(2.) means for movably mounting said main support member to said base frame structure such that said main frame structure may be inclined at various angles relative to said base frame structure to appropriately engage, stabilize and generally support the hull of a boat;

(3.) a pair of adjustable longitudinal and lateral stabilizing and support members operatively interconnected between said main support member and said base frame structure for stabilizing said main support member at each corner area on said base frame structure, and wherein said stabilizing members include first and second stabilizing members with one stabilizing member being a longitudinal stabilizing member that is operatively interconnected between an adjacent longitudinal frame member and said main support member, while the other stabilizing member is a lateral support member and is operatively interconnected between said main support member and an adjacent end-transverse frame member of said base frame structure;

(4.) means operatively associated with said lateral stabilizing members and said base frame structure for adjusting and varying the anchor point of said lateral stabilizing members relative to said base frame structure in order that the orientation of said main support member can be appropriately varied relative to said main frame structure to accommodate the shape and size of a boat hull, said means for varying the anchor points of respective lateral stabilizing members including a plurality of lateral spaced opening formed in each end-transverse member for allowing each lateral stabilizing member to be anchored at a selected opening;

(5.) means for pivotably connecting each longitudinal stabilizing member to a respective longitudinal frame member of said base structure for enabling said longitudinal stabilizing member to pivot with respect to said base frame structure and to generally swing laterally back and forth in response to the anchor point of said lateral stabilizing member being varied, said means for pivotably connecting each longitudinal stabilizing member to a respective longitudinal frame member including a pivot pin fixed to said longitudinal frame member and extending generally parallel therewith, and wherein each longitudinal stabilizing member includes a lower end portion provided with an opening formed therein and wherein said pivot pin extends through said opening within said longitudinal stabilizing member so as to secure the same to said base frame structure and to allow said longitudinal stabilizing member to pivot thereabout;

(6.) means operatively connected to the upper ends of said main support member for engaging the hull of a boat such that the respective vertical support assemblies cooperate to stabilize and generally support the boat about said base frame structure, said means operatively connected to the upper end of said main support member for engaging and stabilizing the boat hull including an upper cradle pad and an interconnecting member operatively interconnected between said cradle pad and said main support member, and means operatively associated with said interconnecting member for adjusting the effective length thereof with respect to said main support member so as to effectively adjust the height of said cradle pad; said interconnecting member extending between said cradle pad and said main support member including a threaded portion and wherein a portion of said interconnecting member extends into an open area formed within said main support member; and wherein there is provided a threaded nut type member disposed about said threaded interconnecting member and which is adapted to rest about a top portion of said main support member such that the effective length of said interconnecting member extending outwardly from the main support member can be adjusted by turning said threaded member; movable mounting means for movably mounting said cradle pad to said interconnecting member extending between said cradle pad and said main support member such that said cradle pad can conveniently assume an orientation generally flush with the hull of the boat being stabilized and engaged; and

C. keel support means normally disposed about said base frame structure and supported thereby for underlying and supporting the keel of said boat while said vertical support assemblies cooperate to engage and stabilize said boat.

4,468,151

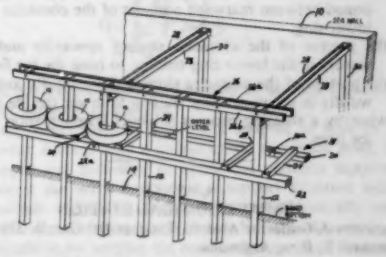
ASSEMBLY FOR DAMPING SEA WAVES

R. Patterson Warlick, Old Chester Rd., P.O. Box 1180, Rte. 2, Chester, N.J. 07930

Filed Apr. 14, 1982, Ser. No. 368,426

Int. Cl.³ E02B 3/06

U.S. Cl. 405—27 **3 Claims**



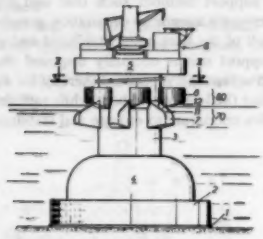
1. A floating breakwater for protecting a sea wall comprising a plurality of vertical pilings extending into the sea bed and spaced from and parallel to said sea wall and about which are positioned doughnut-shaped energy absorbing members free to move vertically with respect to said pilings, a buoyant platform supporting said energy absorbing members, said platform comprising struts on opposite sides of said pilings and extending parallel to said sea wall and including transverse stringers maintaining said struts in parallel and spaced relationship to each other and free to move vertically with respect to said pilings, the combined buoyancy of said energy absorbing members and said platform being such that the top surfaces of said energy absorbing members are positioned substantially at the surface of the sea, a support beam structure attached to said pilings generally along the tops thereof and interconnecting said pilings to aid in maintaining said pilings in vertical and spaced-apart relationship and providing a limit on upward movement of said energy absorbing members and said platform, and rigid tie-back members connected to said pilings and said sea wall to aid in maintaining said pilings in vertical and spaced-apart relationship.

4,468,152

ICEBREAKER SYSTEM FOR MARINE PLATFORMS

Jacques E. Lamy, Fontenay-Aux-Roses, and Francisco de Asis Manuel Serrano, Issy-Les-Moulineaux, both of France, assignors to Compagnie Generale pour les Developpements Operationnels des Richesses sous-Marines "C.G. Doris", Paris, France

Filed Nov. 13, 1981, Ser. No. 321,050
Claims priority, application France, Nov. 14, 1980, 80 24237
Int. Cl.³ E02B *15/02*; B63B *35/12*
U.S. Cl. 405—61 17 Claims



1. An icebreaker system for marine platforms or structures erected in seas liable to freeze comprising:

a lower ring and an upper ring of obstacles mounted around pillars of the platform to be protected,

the obstacles in the lower ring having a portion sloping upwardly and rearwardly with its front portion lying below the lower level of ice floes at lowest tide,

the obstacles in the upper ring thereof being staggered with those of the lower ring and having a portion downwardly and rearwardly with its front portion lying above the upper level of ice floes at highest tide,

rearward portions of the obstacles of the upper ring positioned between rearward portions of the obstacles of the lower ring,

the portion of the obstacles sloping upwardly and rearwardly in the lower ring tending to raise the ice floes,

the portion of the obstacles sloping downwardly and rearwardly in the upper ring tending to lower the ice floes,

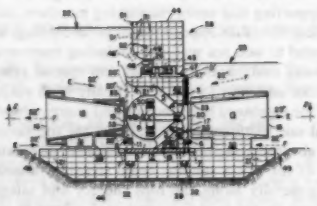
whereby a shearing process achieves fragmentation of the ice floes.

4,468,153

SYMMETRIC TIDAL STATION

Francisco J. Gutierrez Atencio, Estafeta Dr. Garcia, 3101 Diamanta- E. Rios, Argentina

Filed May 12, 1982, Ser. No. 377,675
Int. Cl.³ E02B *9/00*
U.S. Cl. 405—78 23 Claims



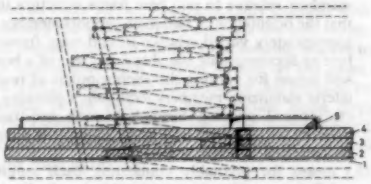
1. A tidal station including a caisson having a fluid flow conduit therethrough communicating with the basin and sea sides of said caisson, a hydromotive assembly within said conduit and disposed substantially symmetrically respective said caisson, said hydromotive assembly provided with a fluid flow conduit therethrough having opposite intake and outlet open ends, a turbine/generator set within said hydromotive assembly conduit, a first diffuser affixed to said caisson on one side thereof and having an inlet juxtaposed one said hydromotive assembly conduit open end, a second diffuser fixedly attached adjacent the opposite side of said caisson and having an inlet juxtaposed another one said hydromotive assembly conduit open end, said two diffuser inlets symmetrically disposed relatively said hydromotive assembly and means displacing said hydromotive assembly between selected positions alternatively positioning said hydromotive assembly conduit intake and outlet juxtaposed alternate ones of said first and second diffuser inlets to actuate said turbine/generator set during both ebb and flood tides.

4,468,154

METHOD OF DISPOSAL OR TEMPORARY STORAGE OF WASTE MATERIAL

Klaus Janssen, Goslar; Jürgen Meier, and Siegfried Frank, both of Bad Grund, all of Fed. Rep. of Germany, assignors to Preussag Aktiengesellschaft Metall, Goslar, Fed. Rep. of Germany

Continuation of Ser. No. 189,358, Sep. 22, 1980, abandoned. This application Nov. 13, 1981, Ser. No. 321,203
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939051
Int. Cl.³ E21F *15/08*
U.S. Cl. 405—128 10 Claims



1. A method of transporting and dumping waste material consisting of finer grained and coarser grained particulate solid material, said method comprising the steps of: forming a mixture of said particulate material and a liquid having said particulate material entrained therein wherein the amount of said liquid consists essentially of less than 20% by weight of said mixture, wherein said finer grained material is present in said mixture in a volumetric proportion which is at least equal to the volumetric proportion of the theoretical pore volume of said coarser grained material, and wherein the pore volume of said finer grained material is filled with said liquid; pumping said mixture by means of a piston pump through a pipeline; and discharging said mixture into a dumping space.

4,468,155

METHOD AND DEVICE FOR PLACING IN A DETERMINED RELATIVE POSITION TWO ELEMENTS SUBMERGED IN A CONDUCTING LIQUID MEDIUM

Emile Levallois, Courbevoie; René Szabo, Le Pecq; Jean Clot, Saint-Orens, and Daniel Esteve, Ramonville, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 24, 1982, Ser. No. 444,297
Claims priority, application France, Nov. 24, 1981, 81 21935
Int. Cl.³ F16L *1/04*
U.S. Cl. 405—170 21 Claims

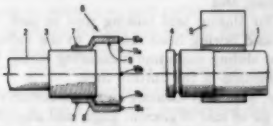
1. A method for placing two elements submerged in a liquid medium in a determined relative position, one of said elements being provided with several electrodes fed with electric current and with acoustic waves emitters-receivers, characterized

by the following steps, each of which is effected one or more times:

(a) at least one electric quantity in relation with the current passing through each of the electrodes is measured,

(b) one of the elements is moved with respect to the other up to a position at which said quantity is the same for at least two electrodes, said position substantially corresponding to the putting in line of a central point of the external face of one element with the axis of the other element,

(c) an acoustic wave is emitted from at least two emitters-



receivers placed on one of the elements and the time interval separating the emission from the reception of said waves is measured so as to determine the distance separating the two elements and the inclination of one element with respect to the other,

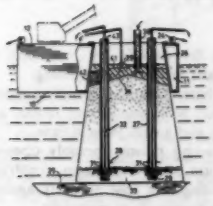
(d) one of the elements is moved with respect to the other, so as to minimize the values of distance and inclination between the elements, thus bringing the latter sufficiently close to each other to make possible the positioning and the alignment of said elements in a complementary guiding phase.

4,468,156

UNDERWATER STRUCTURE AND METHOD FOR ITS CONSTRUCTION

John B. Davis, Oakville, and H. Glen Gilchrist, Calgary, both of Canada, assignors to Golder Associates Ltd., Mississauga, Canada

Filed Mar. 17, 1982, Ser. No. 358,896
Claims priority, application Canada, Dec. 2, 1981, 391361
Int. Cl.³ E02D *15/06, 29/06*
U.S. Cl. 405—222 **19 Claims**



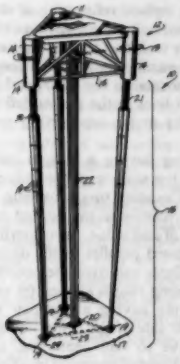
1. A method of constructing a free standing structure in a body of water, said structure having an impervious outer membrane defining a volume containing a lower major layer of drained non-hardenable particulate material and an upper minor layer of hardened material, comprising the steps of attaching an impervious membrane having a base and side portions to a floating formwork positioned at a construction site, filling the membrane with water thereby expanding it to define a volume and causing the base portion to rest on the bed of the body of water, partially filling the volume at least to the bottom of the formwork with non-hardenable particulate material which settles to form a body within the volume while simultaneously removing water from the settled particulate body so that the body of water exerting a confining pressure on the particulate body renders it coherent, filling the remaining portion of the volume within the formwork with hardenable material while simultaneously removing additional water from the underlying settled particulate body, sealing the hardened top of the structure, and removing the formwork.

4,468,157

TENSION-LEG OFF SHORE PLATFORM

Edward E. Horton, Rancho Palos Verdes, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 146,363, May 2, 1980, abandoned. This application May 3, 1982, Ser. No. 374,240
Int. Cl.³ E02B *17/08*; E02D *5/74, 21/00*
U.S. Cl. 405—224 **12 Claims**



1. Apparatus arranged for assembly to define a tension-leg offshore platform comprising

an adjustably buoyant upper unit adapted to float on an ocean surface with a characteristic maximum draft, the upper unit including an operations platform supported above the water surface on a support structure which includes a plurality of laterally spaced substantially vertical hollow columns which include ballast tanks selectively floodable for varying the positive buoyancy of the upper unit,

a corresponding plurality of tension leg assemblies each connectible in tension between the lower end of a corresponding column and the ocean floor, each tension leg assembly comprising:

a plurality of positively buoyant tubular members each connectible at a lower end thereof to anchor means secured to the ocean floor and to extend upwardly to an upper end disposed a selected distance below the ocean surface greater than the maximum draft of the upper unit at a common to the upper ends of all of the tubular members,

for each such tubular member, a corresponding flexible tension member connectible between the upper end of the tubular member and the lower end of the corresponding column, and

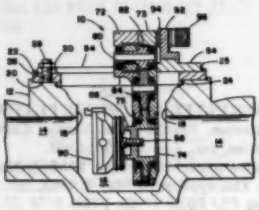
means for connecting the lower end of each tension leg assembly to anchor means secured to the ocean floor and for connecting each flexible tension member between each corresponding tubular member and the column member corresponding to the tension leg assembly of which the the corresponding tubular member is a part.

4,468,158

INPLACE BALL VALVE REPAIR APPARATUS

David R. Pearce, Bremerton, and Archie S. Lien, Poulsbo, both of Wash., assignors to The United States of America as represented by the Secretary of The Navy, Washington, D.C.

Filed Nov. 29, 1982, Ser. No. 445,116
Int. Cl.³ B23B *41/00*
U.S. Cl. 408—16 **4 Claims**



1. Apparatus for inplace refinishing of the annular seating surfaces in top loaded ball valves, said seating surfaces having a desired orientation such that the seating surfaces are inclined inwardly and downwardly at a specified very small angle with respect to a plane normal to the horizontal top surface of the valve's housing and lines in the planes defined by the seating surfaces and parallel to the top surface are parallel, which comprises:

(a) a locating ring having a bottom surface adapted for resting on the top surface of the valve housing, the top surface of said locating ring providing a flat surface oriented similarly relative to the desired orientation of each seating surface of said valve, the centerline of said locating ring being oriented parallel to the desired orientation of the seating surfaces and over the centerline of said valve when said locating ring is aligned on said valve housing, said locating ring having a first pair of apertures positioned on a first side of the centerline and symmetrically disposed relative to said centerline, said locating ring having a second pair of apertures positioned on the second side of the centerline and symmetrically disposed relative to said centerline in the same way that said first pair of apertures are symmetrically disposed;

(b) an alignment gage for positioning said locating ring on the top surface of said valve, said alignment gage including a first plate which is disposed on the top surface of the locating ring, said first plate including a pair of dowel pins disposed to mate with either of said first pair of apertures or said second pair of apertures of said locating ring so that the position of said first plate is precisely fixed on said locating ring, said alignment gage having a second plate which is attached to the first plate and extends downward into the central chamber of the valve when the gage is positioned on the locating ring, said second plate having a pair of measuring gages secured thereto, each gage having a measuring tip and an indicator, said measuring gages being oriented so that the measuring tip of each gage is perpendicular to the centerline of said locating ring when said alignment gage is positioned on the locating ring, the measuring tips of said measuring gages being separated so that the tips are aligned with the sealing surface on opposite sides of the inlet passage of the valve when facing the sealing surfaces, said first plate having openings for viewing the measuring tips and indicators of said measuring gage when said alignment gage is disposed on said locating ring;

(c) a carriage plate having a bottom surface adapted to rest on the top surface of said locating ring, said carriage plate having a pair of dowel pins disposed to mate with either said first pair of apertures in said locating ring or said second pair of apertures in said locating ring, said carriage plate being disposed on said locating ring after said carriage plate being positioned on said valve through use of the alignment gage, said carriage plate having channel-forming means, the channels formed by said channel-forming means being parallel and inclined at said very small angle with respect to the bottom surface of said carriage plate;

(d) a cutting tool having a housing adapted to be supported by said channels and slide in said channels, said cutting tool including a boring head disposed to face the sealing surface of said valve and having its cutting plane oriented normal to the channel formed by said channel-forming means, said cutting tool having means for driving said boring head; and

(e) means for sliding said cutting tool in said channels to position said boring head relative to the valve face, said means for sliding including measuring means for indicating the position of the cutting tool;

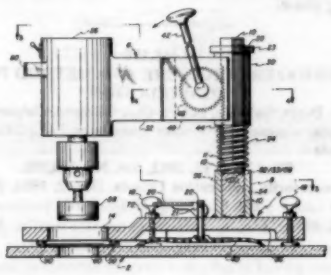
(f) whereby, after said locating ring is accurately positioned with the air of said alignment gage, said alignment gage is removed from said locating ring and said carriage plate with said cutting tool thereon is inserted into said apertures in said locating ring.

4,468,159

DRILL PRESS AND STAND

Stanley M. Oster, 6951 NW. 15 Ave., Fort Lauderdale, Fla. 33309

Filed Dec. 7, 1981, Ser. No. 327,763
Int. Cl.³ B23B *41/00, 39/14*
U.S. Cl. 408—56 **4 Claims**



1. An apparatus for drilling by a drilling means holes through vitreous sheet materials comprising:

a stand having a base, a suction mounting means, a coolant reservoir, a drill press supporting collar, a plurality of leveling screws and a drill press means;

said suction mounting means operably connected to said base, said suction mounting means constructed and arranged for holding said base securely against the upper surface of the vitreous sheet materials;

said coolant reservoir including an opening for viewing the drilling operation and for the passage of the drilling means said coolant reservoir including a dam attached to said base;

said dam forming a continuous liquid seal over the entire perimeter of said dam;

said dam having at least a resilient contacting surface for contacting the vitreous sheet material over the entire perimeter of said dam when said base is attached to the vitreous sheet material by said suction mounting means, said contacting surface sufficiently sealing the perimeter of said dam to produce a liquid seal between the vitreous sheet material and said dam;

said supporting collar connected to said base;

said leveling screws connected to said base and operably mounted to provide proper alignment of said base and said

supporting collar to the vitreous sheet materials being drilled, said leveling screws having lower ends that contact the vitreous sheet material; and

said drill press means including a means for linearly positioning said drill press means axis generally perpendicularly to said base and for moving said drill press means toward or away from the upper surface of the vitreous sheet material;

said drill press means having a motor, a drill tool means operably attachable to said motor, a motor support means interconnectable between said motor and said stand;

said collar including a means for index positioning said drill press means in relation to said collar in one of two drill positions about the pivotal axis of said support mounting means for quick positioning:

said two drill positions located to provide adjacent drill alignment within said coolant reservoir.

said drill sized to cut a hole of a preselected diameter;

said two drill positions located a preselected radial distance apart about said pivotal axis;

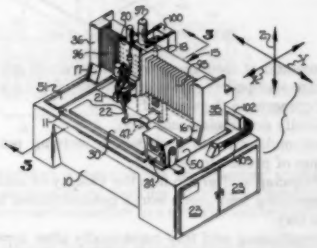
said two drill positions, said preselected raidal distance, and said preselected diameter each selected so that by cutting said hole through said vitreous sheet material at each of said two drill positions the resulting holes are adjacent to one another.

4,468,160

WOODWORKING MACHINE

Robert L. Campbell, Jr., Hickory, assignor to Campbell Automation, Incorporated, Hickory, N.C.

Filed Sep. 9, 1982, Ser. No. 416,155
Int. Cl.³ B23C *1/06*
U.S. Cl. 409—202 **12 Claims**



9. A woodworking machine including a main frame, a workpiece supporting bed extending across the medial portion of said main frame, first machine ways supported on said main frame and extending forwardly and rearwardly along each side of said bed, a pair of upright side supports positioned adjacent opposite sides of said bed, the lower ends of said upright side supports being supported for movement on said first machine ways, drive means for moving said side suports forwardly and rearwardly along said first machine ways, a gantry extending above and across said bed and including opposite ends connected to and movable with the upper ends of said side supports, said gantry including a cast main beam formed of lightweight material to facilitate rapid movement, particularly rapid acceleration and deceleration during forward and rearward movement of said gantry, said lightweight main beam including integrally cast longitudinally and laterally extending ribs to provide stiffness and rigidity thereto, second machine ways connected to and extending longitudinally of said gantry, a vertically movable tool holder mounted for longitudinal movement along said second machine ways, and drive means for moving said tool holder along said second machine ways from one side to the other of said gantry.

4,468,161

SHEET CARRYING A WELDED NUT

Guenther Krueger, 16 Bristol Ct., Berkeley Heights, N.J. 07422

Continuation-in-part of Ser. No. 180,666, Aug. 25, 1980, Pat. No. 4,281,786. This application May 6, 1981, Ser. No. 238,932
Int. Cl.³ F16B *37/06*; B23K *20/02*
U.S. Cl. 411—171 **5 Claims**

1. An article comprising: a sheet having an aperture-forming wall-portion forming a through-channel, an undercut nut having a female threaded bore extending axially therethrough, the nut being welded into the through-channel, of which the undercut nut has a shaft with shaft upper and lower circumscribing side walls, has a circular top having a uniform diameter greater than an upper-end of the through-channel in which the undercut nut is mounted, and has a resulting circular overhanging-edge of said uniform diameter compacted into an upper surface of said aperture-forming wall-portion of said sheet, said overhanging edge of said uniform diameter in its compacted state having spaced-apart points thereof of greater nut-top diameter than of the nut overhanging edge before compaction thereby locking said nut against rotary movement when subjected to torque forces of large magnitude exerted on the nut, said upper surface at said spaced-apart points being indented in its compacted-state to a level below remaining other portions of said upper surface, the undercut nut having a length greater than a thickness of said sheet and having said shaft upper circumscribing side wall undercut within a thickness of said sheet at an uppershaft location, said shaft being undercut to a lesser shaft-diameter than a lower diameter of the shaft circumscribing wall, and lower portions of the wall-portion of said sheet being compacted upwardly and laterally into a welded-contact with the shaft circumscribing side wall, said lower portion being indented.

4,468,162

CONTROL MEANS FOR A MECHANICAL FINGER CLAMP

Kazunori Kuromoto, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 451,802
Claims priority, application Japan, Dec. 23, 1981, 56-190900
Int. Cl.³ B25J *3/00*
U.S. Cl. 414—4 **3 Claims**

1. A control means for a mechanical finger clamp, said finger clamp including mounting means, a plurality of articulate

fingers connected to the mounting means for pivotal motion, each articulate finger having a first segment pivotally connected to the mounting means and a second segment connected to the first segment for pivotal motion, first means for pivotally moving the first segments of the articulate fingers relative to the mounting means, second means for pivotally moving the second segments of the articulate fingers relative to the first segments, said control means comprising:

a control lever for said mechanical finger clamp, said control lever having a grip formed at one end thereof;

a first member projecting from said control lever in a predetermined direction for defining a first spacing between the same and said grip;

a second member projecting from said control lever in the opposite direction for defining a second spacing between the same and said grip;

a source of pressurized fluid;

a plurality of solenoid-operated control valves for selectively supplying pressurized fluid from said source to said first and second means;

a first switch mounted on one end face of said grip;

a second switch mounted on said one end face of said grip downwardly spaced from said first switch;

a third switch mounted on the opposite end face of said grip;

a fourth switch mounted on the opposite end face of said grip downwardly spaced from said third switch;

a fifth switch mounted on said first member opposite said first switch;

a sixth switch mounted on said first member opposite said second switch;

a seventh switch mounted on said second member opposite said third switch; and

an eighth switch mounted on said second member opposite said fourth switch;

said first and third switches being adapted to operate said solenoid-operated control valves in such a way that said first means is actuated to move said first segments towards each other, said second and fourth switches being adapted to operate said solenoid-operated control valves in such a way that said second means is actuated to move said second segments towards each other, said fifth and seventh switches being adapted to operate said solenoid-operated control valves in such a way that said first means is actuated to move said first segments away from each other, and said sixth and eighth switches being adapted to operate said solenoid-operated control valves in such a way that said second means is actuated to move said second segments away from each other.

4,468,163

TRAY LOADER METHOD AND APPARATUS FOR NUCLEAR FUEL PELLETS

Harold B. King, Wrightsville Beach, N.C.; Ching C. Lai, Livermore, Calif., and Edward S. Walker, Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 25, 1982, Ser. No. 362,046

Int. Cl.³ G21C *19/18*

U.S. Cl. 414—21 **11 Claims**

1. An automatic apparatus for receiving pellets from a source, accumulating said pellets into groups and loading successive layers of said groups onto a tray; said apparatus comprising:

feeder means for receiving and transporting said pellets from said source;

a staging area for receiving said pellets from said feeder means;

rotatable blade means adapted to cooperate with said staging area for accumulating said groups of pellets and further adapted to deposit said groups onto said tray;

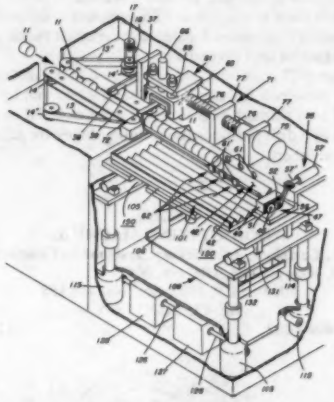
pusher means for advancing each of said groups fully onto said rotatable blade means preparatory to depositing each group onto said tray;

horizontal translation means for horizontally positioning said tray to receive successive groups of pellets;

vertical translation means for vertically positioning said tray to receive said successive layers of groups;

optical means disposed adjacent to said blade means for sensing the assembly of each group of pellets and for developing and transmitting signals which indicate the assembly of said groups; and

control means for receiving said electrical signals, for actuating said pusher means on indication of assembly of a group, for actuating said rotatable blade means to deposit each group onto said tray, for actuating said horizontal translation means to reposition said tray horizontally with each deposit of a group on said tray and for actuating said vertical translation means to reposition said tray vertically with each completion of a layer of groups on said tray.



4. A method of loading a tray with layers of groups of pellets, where said pellets arrive periodically from a source, said method comprising the steps of:

(a) initially positioning said tray;

(b) accumulating said periodically arriving pellets into a group of predetermined size;

(c) advancing said group into the vicinity of said tray;

(d) depositing said group into a predetermined location on said tray;

(e) repositioning said tray horizontally after deposit of said group to receive deposit of another group;

(f) repeating steps (b)–(e) until a predetermined number of locations constituting a layer are filled;

(g) repositioning said tray vertically after said layer is filled; and

(h) repeating steps (b)–(g) until a predetermined number of layers on said tray are filled.

4,468,164

METHOD AND APPARATUS FOR FEEDING RAW MATERIAL TO A FURNACE

Charles S. Dunn, Pataskala, and Stephen Seng, Bladensburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 5, 1982, Ser. No. 405,659

Int. Cl.³ C03B *3/00*

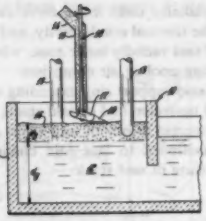
U.S. Cl. 414—165 **4 Claims**

4. An apparatus for feeding batch material to an arc melting furnace containing a body of molten material with a blanket of unmelted batch material on the surface and having a plurality of arcing locations defined by vertical arc electrodes having a total thickness thereof comprising:

a feed chute having its discharge end located in the furnace at or near the batch blanket,

means for continuously supplying batch material to the feed chute wherein the chute is essentially filled with batch material at all times,

a rotatable trough aligned with the discharge end of the feed chute,



means for spreading the batch material on the batch blanket extending outwardly from the trough, and

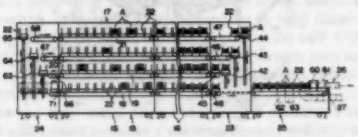
means for continuously rotating the trough and spreader means to keep the total batch blanket and molten material thickness constant.

4,468,165

APPARATUS FOR TRANSPORTING SORTED STACKED MATTER

Kazumi Kawasaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 25, 1982, Ser. No. 411,365
Claims priority, application Japan, Aug. 28, 1981, 56-135133
Int. Cl.³ B65G *37/00*
U.S. Cl. 414—417 **7 Claims**



1. A transport apparatus for transporting sorted stacked matter in a plurality of stacking boxes in a plurality of rows arranged one above another to a next process section, comprising:

first horizontal conveyor means disposed on the back side of said respective rows of stacking boxes and movable along these stacking box rows for conveying trays containing transported matter in one direction, said conveyor means having a starting end and a forward end;

tray lowering means vertically disposed adjacent to the forward end of said first horizontal conveyor means for receiving trays from the individual level stages of said first horizontal conveyor means and lowering the received trays;

second horizontal conveyor means consisting of a single level stage having a starting end connected to said tray lowering means for receiving trays from said tray lowering means and conveying the received trays horizontally up to a forward end of the second horizontal conveyor means;

means for transferring transported matter from each tray at said forward end of the second conveyor means to said next process section;

third horizontal conveyor means for receiving each empty tray from said second horizontal conveyor means and conveying the received empty tray horizontally up to a forward end of the third horizontal conveyor means; and

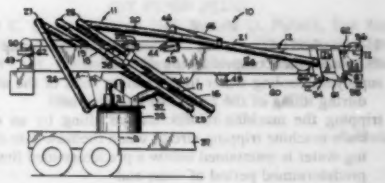
empty tray raising means connected to the forward end of said third horizontal conveyor means for receiving empty trays from said third horizontal conveyor means and distributing the received trays to the starting end of the individual level stages of said first horizontal conveyor means.

4,468,166

APPARATUS FOR EXTENDING AND RETRACTING TELESCOPING BOOMS AND PIPELINES

Neal E. Jameson, Orange, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 8, 1982, Ser. No. 396,511
Int. Cl.³ B67D *5/365*
U.S. Cl. 414—690 **4 Claims**



1. Apparatus for extending and retracting a telescoping boom assembly and an articulated pipeline mounted on said boom assembly, said boom assembly including a fixed inboard section and first and second movable sections, said first movable section being extendably connected to said inboard section, said second movable section being extendably connected to said first movable section, said apparatus comprising:

first, second and third winches each mounted on said inboard boom section;

first, second and third sheaves;

first, second and third cables,

means for rotatably mounting said first sheave on an outer portion of said inboard boom section;

means for connecting said first cable between said first winch and an inboard portion of said first movable section, said first cable being trained about said first sheave;

means for rotatably mounting said third sheave on an outer portion of said first movable section;

means for connecting said third cable between said inboard section and an inboard portion of said second movable section, said third cable being trained about said third sheave;

means for rotatably mounting said second sheave on an outer portion of said second movable section;

means for connecting said second cable between said second and said third winches, said second cable being trained about said second sheave;

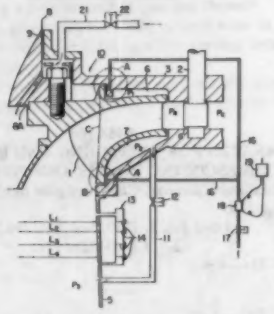
a trolley movably mounted on said boom assembly and connected to an outboard portion of said articulated pipeline to support a portion of said pipeline; and

means for connecting said trolley to said second cable wherein actuation of said second winch causes said trolley to move outwardly along said boom assembly when said third winch is free wheeling and actuation of said second winch causes said first and said second movable sections to retract when said third winch is in a locked position.

4,468,167
METHOD OF OPERATING WATER-TURBINE OR PUMP WATER-TURBINE

Kenzyu Ogiwara, Hitachi, and Tooru Osanai, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 320,090
Claims priority, application Japan, Nov. 19, 1980, 55-161950
Int. Cl.³ F03B 21/06, 3/10
U.S. Cl. 415—1 8 Claims



1. A method of operating a water-turbine or a pump water-turbine machine, comprising the steps of:

supplying cooling water to the runner seals of the machine during idling of the runner of the machine;

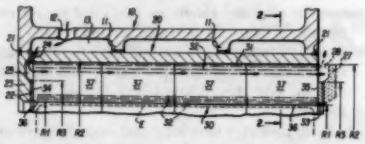
tripping the machine to discontinue idling by an excited main machine tripping circuit when the flow rate of cooling water is maintained below a predetermined limit for a predetermined period of time; and

exciting the machine tripping circuit to make it operative only when the pressure around the runner reaches a level approximating the pressure in the draft pipe of the machine so that said step of tripping does not occur at higher pressures.

4,468,168
AIR-COOLED ANNULAR FRICTION AND SEAL DEVICE FOR TURBINE OR COMPRESSOR IMPELLER BLADE SYSTEM

Christian B. Aubert, Chartrettes, France, assignor to S.N.E.C.-M.A., Paris, France

Filed Nov. 16, 1982, Ser. No. 442,188
Claims priority, application France, Nov. 16, 1981, 81 21353
Int. Cl.³ F01D 11/08
U.S. Cl. 415—116 13 Claims



1. An air cooled annular friction and seal structure for the blades of a machine having a stator and rotor in a stream of gases, said structure comprising:

a support ring radially surrounding said blades;

an axial stack of at least one seal ring fixed to the radially inner surface of said support ring and in closely facing relation to said blades, each said seal ring being formed of a metal superalloy which is refractory under conditions of use;

a plurality of axial channels extending entirely through the entire cross-section area of said stack of seal rings between an upstream end and a downstream end thereof, said channels extending parallel to a surface generated by the rotation of said blades;

means for closing at least the upstream end of a radially inner portion of said stack; and

means for introducing cooling air to the upstream end of a radially outer portion of said stack, whereby said channels of said radially inner zone form closed cavities which reduce the thermal conductivity, and increase the abradability, of said radially inner zone, wherein said means for introducing cooling air comprises:

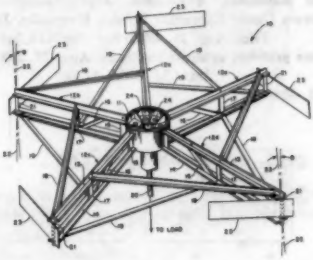
a flange of said support ring extending radially inward adjacent said upstream end of said stack; and

an annular recess in one of said stack and said flange, said recess positioned to face said channels of said radially outer portion of said stack.

4,468,169
REGULATED HIGH TORQUE FLEXIBLE BLADED WIND WHEEL

Dennis L. Williams, 1520 E. Canyon Dr., South Weber, Utah 84403

Filed Aug. 18, 1982, Ser. No. 409,231
Int. Cl.³ F03D 7/06
U.S. Cl. 416—119 4 Claims



1. In a windmill device including a wind wheel configured to rotate in a generally horizontal plane on a vertically disposed drive shaft, an improvement wherein said wind wheel comprises:

a. means defining a framework mounted for rotation with said drive shaft in a generally horizontal plane;

b. a plurality of second rotatable shafts supported by said framework in a radially spaced relationship to said drive shaft;

c. a plurality of flexible vanes, each of said vanes mounted near one end thereof to a said second shaft for rotation therewith;

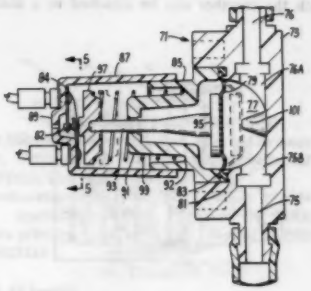
d. each of said second shafts mounted for rotation about an axis which is tilted with respect to a vertical to said horizontal plane whereby each said vane has a preferred predetermined rest position defined by the direction of tilting of each said axis from a said vertical, each said axis being tilted at a tilt angle having a component in the same tangential direction and including a radially inwardly directed component, whereby said vanes, in their rest positions, are oriented substantially identically relative to a radius through their respective axes of rotation; and

e. a plurality of vane stops disposed on said framework radially inwardly of said second shafts for limiting the rotation of each vane about its respective axis of rotation, said stops disposed on said framework to allow said vanes to rotate past said stops when said vanes are flexed to a predetermined degree.

4,468,170
LOW LEVEL INDICATOR

Richard E. Hanset, Santa Cruz, Calif., assignor to Beta Technology, Inc., Santa Cruz, Calif.

Continuation-in-part of Ser. No. 167,705, Jul. 11, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 385,434
Int. Cl.³ F04B *49/06*; H01H *35/34*
U.S. Cl. 417—44 **2 Claims**



1. In a device wherein a liquid is drawn from a reservoir of said liquid by means of a pump, a low level warning device comprising in combination:

a. a suction line dipping into the liquid in a reservoir from which a quantity of liquid is to be withdrawn,

b. a diaphragm opposite a central chamber in said line, the entire surface of said diaphragm being directly in the line of flow of said liquid whereby liquid flows in direct turbulent contact across the surface of the diaphragm and there is no constriction between said line and said diaphragm,

c. a switch actuated by said diaphragm, said diaphragm being drawn in when suction is placed on said line and liquid is in said reservoir and said diaphragm moving out when a column of liquid is not maintained below said diaphragm whereby

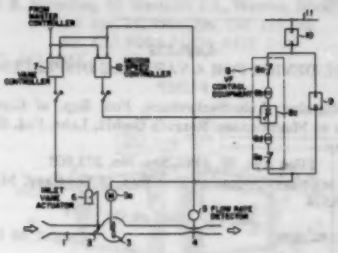
d. outward movement of said diaphragm actuates a switch and said switch actuates a warning device, and stop means in said central chamber opposite said diaphragm for preventing excessive excursions of said diaphragm and for promoting liquid turbulence across said diaphragm.

4,468,171
METHOD OF CONTROLLING AIR FLOW RATE OF FAN

Haruo Katsumata; Takeshi Matsuya; Hitoshi Saitoh, all of Iwaki; Shigeru Yasuki, Yokohama; Yukio Sato, Tokyo; Masaru Osaki; Minoru Komeno, both of Yokohama; Takayuki Arai, Ichikawa; Shigeki Ochi, Yokohama, and Tatsuo Ino, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo; Fuji Electric Company Limited, Kanagawa and Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, all of, Japan

Filed Nov. 29, 1982, Ser. No. 445,177
Claims priority, application Japan, Nov. 27, 1981, 56-190088
Int. Cl.³ F04B *49/06, 49/00*
U.S. Cl. 417—53 **3 Claims**

1. A method of controlling the air flow rate of a fan with the use of a system for controlling the air flow rate of the fan, which system comprises adjustable speed control means of a motor for driving the fan, commercial power supply circuit means provided in parallel with the adjustable speed control means, and control circuit means for controlling the degree of opening of an inlet vane of the fan, said system controlling the fow rate by changing over between adjustable speed control of the motor and control of the inlet vane, said method comprising the steps of stopping the adjustable speed control means during operation of the motor by the adjustable speed control means with the inlet vane in fully open state, simultaneously throttling the inlet vane at a preset speed to a degree of opening appropriate for the load by means of said control circuit means, and, after a time period necessary for reduction of

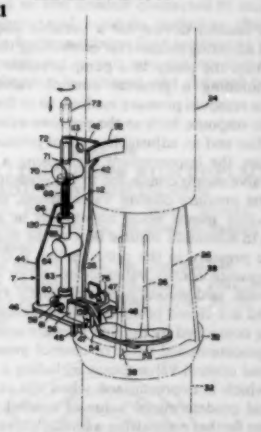


residual voltage of the motor, changing over to operation by the commercial power supply thereby to shift to control by the inlet vane.

4,468,172
JET PUMP PLUG

Robert C. Dixon, Morgan Hill; Ronald D. Poland, San Jose; Bradley G. Stoll, San Jose, and Bob Y. Okashima, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 8, 1983, Ser. No. 472,870
Int. Cl.³ F04F *5/00*
U.S. Cl. 417—151 **9 Claims**



1. A jet pump plug for sealing off a multi-nozzle jet pump, the nozzles of said jet pump being clustered such that access to the nozzle cluster is available through a selected one of a plurality of openings in the structure of said jet pump:

said jet pump plug comprising:

at least first and second plug sections including means for closing off said nozzles;

means for partially inserting said plug sections in sequence through said selected opening to bring the corresponding closure means to the vicinity of said nozzles;

means for orienting said closure means of said inserted first plug section relative to said nozzles including means for aligning said first plug section with respect to said pump structure;

means for orienting said closure means of said inserted second plug section relative to said nozzles including means

for aligning said second plug section with respect to said first plug section; and

means for separately manipulating said oriented closure means to bring them into sealing relationship with said nozzles.

4,468,173

CONTROL DEVICE FOR A VARIABLE DISPLACEMENT PUMP

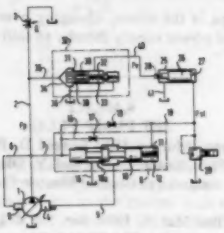
Jörg Dantlgraber, Lohr-Sackenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,808

Claims priority, application Fed. Rep. of Germany, May 11, 1981, 3118576

Int. Cl.³ F04B 49/08

U.S. Cl. 417—220 10 Claims



1. In a control device for a variable displacement pump having an adjusting element for controlling the volume of flow of fluid from the pump to a pump pressure line, the control device including a pressure control valve means, which supplies or removes pressure medium to or from said adjusting element in response both to the pressure existing in the pump pressure line and an adjustable control pressure as a reference input value, the improvement comprising a second pressure control valve means connected to the pressure line in addition to the first pressure control valve means, said first pressure control valve means being maintained in a position corresponding to maximum volume flow of the displacement pump, while the pressure in the pressure line is controlled by said second pressure control valve means, when low control pressure prevails, said second pressure control valve means being maintained in a closed position and the pressure in the pressure line being controlled by the first pressure control valve means when a predetermined value of control pressure is exceeded, said second control valve means including a control chamber means, which is depressurized when the control pressure is below said predetermined value of control pressure, the improvement further comprising a further valve means subject to said control pressure and connected to said control chamber means for controlling depressurization thereof.

4,468,174

HELICOPTER TRANSPORTABLE MUD PUMP

Dale H. Pryor, Odessa, Tex., assignor to Oime, Inc., Odessa, Tex.

Filed Nov. 30, 1981, Ser. No. 325,690

Int. Cl.³ F04B 37/00, 23/06; F16D 1/02

U.S. Cl. 417—238 6 Claims

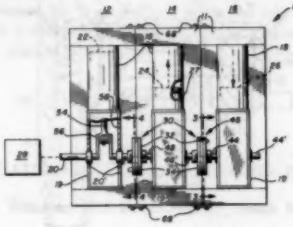
1. A multi-stage pump assembly which includes three stages, each stage being separable into individual stages to enable each of the individual stages to be transported by helicopter from one to another geographical location;

each individual stage includes a crankshaft housing and a main frame, a cylinder attached to said housing, a piston reciprocatingly received within said cylinder, said crankshaft being attached to said crankshaft housing and having a marginal end which extends laterally away from said housing for connection to a prime mover;

attachment means by which the main frame of each individual stage can be disconnected one from the other;

a coupling means by which axially aligned series connected shafts may be connected together in timed relationship respective to one another;

said coupling means includes a first and second member each having confronting faces, and each member having means by which the member can be attached to a shaft end,



means releasably connecting said first and second members together;

index means on said coupling means by which one shaft is oriented respective to an adjacent shaft to cause each of the series connected shafts to be connected in timed relationship;

said index means includes a pin and pin receiving slot located in spaced relationship and arranged 180° apart on the confronting face of each coupling member, the pin of one coupling member is received within the slot of another coupling member.

4,468,175

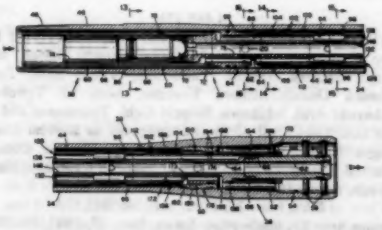
FLUID DRIVEN SUCCESSIVE STAGE BLADDER PUMP

Douglas B. Owen, Rochester, Mich., assignor to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Continuation-in-part of Ser. No. 175,281, Aug. 4, 1980, Pat. No. 4,360,320. This application Sep. 28, 1982, Ser. No. 425,515

Int. Cl.³ F04B 43/10, 35/02

U.S. Cl. 417—394 33 Claims



1. A liquid module for use in a well, said liquid module including an elongate housing, a lower coupling core located in a lower end portion of said housing in sealing engagement therewith, an upper coupling core located in an upper end portion of said elongate housing, passage-forming means extending between said lower core and said upper core and forming passages therebetween, said passage-forming means being affixed to both of said cores, said cores having passage means communicating with said passages for supplying gas to and receiving gas from said passages, and said coupling cores having additional passage means for supplying liquid upwardly through said elongate housing around said passage-forming means between said cores, said upper core having support

means engaging an upper portion of said elongate housing for supporting said lower coupling core and said passage-forming means from said upper coupling core.

4,468,176

TURBINE DRIVEN PUMP

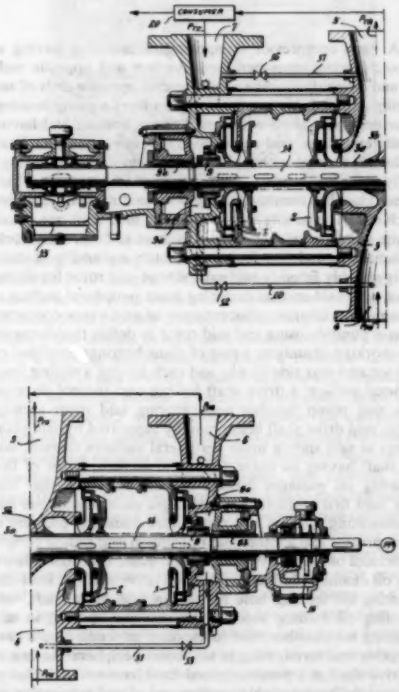
Helmut Münch, Frankenthal, Fed. Rep. of Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal(Pfalz), Fed. Rep. of Germany

Continuation of Ser. No. 275,255, Jun. 19, 1981,. This application Oct. 25, 1983, Ser. No. 545,118

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023219

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—406 **8 Claims**



1. In a turbine driven pump, the combination of a liquid pump unit having an inlet and an outlet; a liquid turbine unit having an inlet and an outlet; a common shaft for said units; and an intermediate section adapted to withstand relatively low pressures disposed between, common to and coupling said units, wherein said units each include a portion adapted to withstand relatively high pressures and a relief plunger surrounding said shaft in this respective high-pressure portion and wherein the inlet for said pump unit and the outlet for said turbine unit are disposed in the intermediate portion.

4,468,177

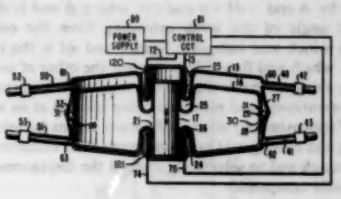
DIAPHRAGM PUMP ARRANGEMENT IN WHICH ALTERNATELY EXPANDED AND CONTRACTED CHAMBERS ARE USED INDEPENDENTLY

Walter E. Strimling, 63 Westcliff Rd., Weston, Mass. 02193

Filed Apr. 27, 1981, Ser. No. 257,752

Int. Cl.³ F04B *17/04*; A61F *1/00*

U.S. Cl. 417—413 **6 Claims**



1. A pump including:

a housing;

a diaphragm having a hollow rigid center portion and a flexible, annular-shaped membrane portion having its periphery attached to the housing at a center line thereof so as to divide said housing into first and second isolated pump chambers;

means for moving the diaphragm in a push-pull manner to enlarge and then reduce the volume of each of said pump chambers alternately; and

an entrance and an exit conduit connected to each of said pump chambers, said conduits including check valve arrangements for permitting a fluid medium to enter said entrance conduit and to exit said exit conduit when the associated chamber is enlarged and reduced in volume respectively.

4,468,178

SCROLL TYPE COMPRESSOR WITH DISPLACEMENT ADJUSTING MECHANISM

Masaharu Hiraga, Honjo; Atsushi Mabe, Isesaki, and Yuji Yoshii, Takasaki, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Mar. 9, 1982, Ser. No. 356,648

Claims priority, application Japan, Mar. 9, 1981, 56-33646

Int. Cl.³ F04B *49/02*; F04C *18/02, 29/10*

U.S. Cl. 417—440 **7 Claims**

1. In a scroll type compressor including a pair of scrolls each having an end plate and a wrap extending from one side surface of said end plate, said wraps interfitting at angular and radial offset to make a plurality of line contacts between said wraps to define at least one pair of sealed off fluid pockets, and a driving mechanism operatively connected to one of said scrolls for orbiting said one scroll relative to the other scroll while preventing rotation of said one scroll to thereby change the volume of the fluid pockets, one of said end plates having

at least one pair of holes through it to interconnect a lower pressure space with fluid pockets which are newly formed at an outer portion of said scrolls, said holes being located at symmetrical locations along the wrap which extends from the last-mentioned end plate so that said other wrap simultaneously crosses over both of said holes to simultaneously block communication through both of said holes, a first of said holes opening along the inner wall of the wrap which extends from the last-mentioned end plate and being located within an area defined by ϕ end $>\phi$I$>\phi$ end-2π, where ϕ end is the final involute angle of the wrap extending from the end plate through which said holes are formed and ϕI is the involute angle at which said first hole is located, the other of said holes opening along the outer wall of the wrap which extends from the last-mentioned end plate and being located at an involute angle of approximately ϕI-π, and control means for selectively opening and closing said holes to permit fluid communication therethrough and to selectively control the displacement volume of said compressor.

4,468,179

FUEL INJECTION PUMPING APPARATUS

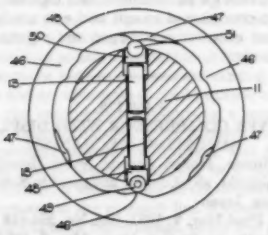
Ivor Fenne, Greenford, and Dorian F. Mowbray, Burnham, both of England, assignors to Lucas Industries, Public Limited Company, Birmingham, England

Filed Jan. 25, 1983, Ser. No. 460,776

Claims priority, application United Kingdom, Feb. 5, 1982, 8203447

Int. Cl.³ F04B *29/00*

U.S. Cl. 417—462 **5 Claims**



1. A fuel injection pumping apparatus comprising a rotary distributor member located in a housing and arranged in use to be driven in timed relationship with an associated engine, outlet ports in the housing for connection in use to injection nozzles respectively of the associated engine, a pair of pumping plungers slidable within respective communicating radial bores in the distributor member, a delivery passage communicating with said bores and arranged to register in turn with said outlet ports during successive inward movements of the plungers, means for supplying fuel to said bores, annular cam means for imparting inward movement to the plungers, said bores being defined by a diametrically disposed drilling and said cam means comprising a first annular cam ring for actuating one plunger and a second annular cam ring for actuating the other plunger, each cam ring having a cam lobe or cam lobes equal in number to the number of cylinders of the associated engine, cam followers associable with the plungers respectively, said cam followers being located at the outer ends of the plungers respectively, said cam followers being constructed so that one follower and the associated plunger is actuated by the lobe or lobes on the first of said cam rings and the other follower and the associated plunger is actuated by the cam lobe or lobes on the second of said cam rings, the cam rings being angularly displaced such that inward movement is imparted to the plungers at the same time during rotation of the distributor member.

4,468,180

VANE COMPRESSOR HAVING INTERMITTENT OIL PRESSURE TO THE VANE BACK PRESSURE CHAMBER

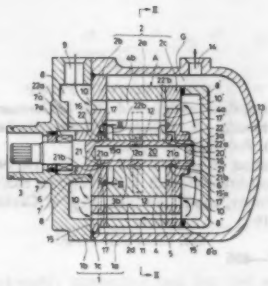
Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed May 17, 1983, Ser. No. 495,499

Claims priority, application Japan, May 21, 1982, 57-85798

Int. Cl.³ F04C *18/00, 29/02*

U.S. Cl. 418—15 **10 Claims**



1. A vane compressor comprising: a cam ring having an endless camming inner peripheral surface and opposite ends; front and rear side blocks secured to said opposite ends of said cam ring and cooperating therewith to form a pump housing; a rotor accommodated within said pump housing and having opposite end faces, said rotor having an outer peripheral surface thereof formed with a plurality of axial slits each having a radially inner end, and an interior thereof formed with a back pressure chamber communicating with said radially inner end of each of said axial slits and terminating in at least one of said opposite end faces of said rotor, said front and rear side blocks each having an end face facing said rotor; a plurality of vanes radially slidably fitted in said axial slits of said rotor for sliding contact with said endless camming inner peripheral surface of said cam ring, wherein adjacent ones of said vanes cooperate with said pump housing and said rotor to define therebetween pump working chambers; a pair of plane bearings provided on said front and rear side blocks and each having a sliding inner peripheral surface; a drive shaft having part thereof disposed within said pump housing and carrying said rotor secured thereon, said drive shaft being radially supported by said plane bearings at said sliding inner peripheral surfaces thereof, said drive shaft having an outer peripheral surface; a pair of first lubricating oil passages formed in said front and rear side blocks, said first lubricating oil passages each having one end communicating with oil in a zone under discharge pressure in the compressor and another end opening in said sliding peripheral surfaces of respective ones of said plane bearings; a lubricating oil chamber defined within said drive shaft; at least one lubricating oil feeding hole formed in said drive shaft, said lubricating oil feeding hole having one end opening in said lubricating oil chamber, said lubricating oil feeding hole having another end terminating in said outer peripheral surface of said drive shaft at a predetermined axial location such that as said drive shaft rotates, said another end of said lubricating oil feeding hole intermittently registers with said another end of a corresponding one of said first lubricating oil passages; at least one second lubricating oil passage formed in at least one of said front and rear side blocks, said second lubricating oil passage having one end opening in said sliding inner peripheral surface of a corresponding one of said plane bearings at a predetermined axial location such that as said drive shaft rotates, said one end of said second lubricating oil passage intermittently registers with said another end of said lubricating oil feeding hole, said second lubricating oil passage having another end terminating in said end face of a corresponding one of said

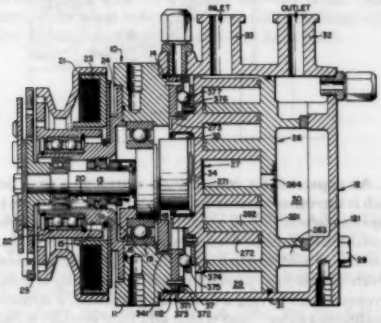
front and rear side blocks at a location positionally corresponding to said back pressure chamber.

4,468,181

IMPROVED ROTATION PREVENTING DEVICE FOR A SCROLL-TYPE FLUID DISPLACEMENT APPARATUS

Seiichi Sakamoto, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Mar. 9, 1982, Ser. No. 356,403
Claims priority, application Japan, Mar. 9, 1981, 56-33647
Int. Cl.³ F01C *1/02, 21/02;* F16D *3/04;* F16C *19/16*
U.S. Cl. 418—55 **7 Claims**



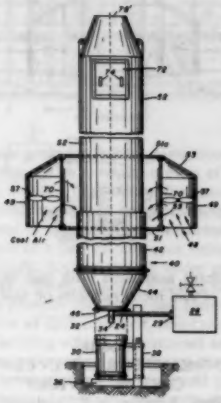
1. In an orbiting member type fluid displacement apparatus including a housing having a front end plate, a fixed member attached to or integral with said housing, an orbiting member having an end plate from which an annular member extends, said fixed and orbiting members interfitting at a radial offset to make a line contact to separate a fluid outlet from a fluid inlet, and a driving mechanism including a rotatable drive shaft connected to said orbiting member to drive said orbiting member in an orbital motion, a rotation preventing/thrust bearing means connected to said orbiting member for carrying axial loads from said orbiting member and preventing the rotation of said orbiting member so that the line contact moves toward the discharge side during orbital motion, said rotation preventing/thrust bearing means including a fixed ring fastened to an inner surface of said housing and an orbiting ring fastened to an axial end surface of said end plate of said orbiting member facing said fixed ring, said fixed and orbiting rings having a plurality of corresponding circular pockets, each pocket on said fixed ring facing a pocket on said orbiting ring corresponding in size, pitch and radial distance, said rotation preventing/thrust bearing means further including a bearing element placed within each facing pair of said corresponding pockets, said corresponding pockets including a predetermined number of rotation preventing pockets on each of said fixed and obtaining rings for interacting with said bearing elements to prevent rotation of said orbiting member during orbital motion, said rotation prevention pockets having a diameter slightly smaller than the diameter of the remaining ones of said corresponding pockets so that said remaining ones of said corresponding pockets do not interact with the bearing elements to prevent the rotation of said orbiting member during orbital motion, the predetermined number of said rotation prevention pockets being smaller than the total number of said corresponding pockets and equal to or greater than three.

4,468,182

APPARATUS FOR CONTROL OF POWDER PRODUCTION

A. David Booz, New Kensington; Daniel R. Barch, Natrona Heights, both of Pa.; Ray A. Kuchera, and David D. White, Jr., both of Rockdale, Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 31, 1982, Ser. No. 413,512
Int. Cl.³ B01J *2/04*
U.S. Cl. 425—7 **10 Claims**



1. An improved apparatus for the production of particulate metal comprising:

(a) a containment vessel having a sidewall extending to a bottom plate;

(b) a source of molten metal external to said vessel;

(c) nozzle means, capable of converting said molten metal into metal particles, carried by said bottom plate, said nozzle means including a central bore and providing communication between said vessel and said external source of molten metal, the sidewall and bottom plate cooperating with the nozzle means to seal off the interior of said vessel and the metal particles therein from the area external to said vessel adjacent said source of molten metal;

(d) a source of atomizing gas flowing through said nozzle means into said vessel; and

(e) means for removing depositions of metal and metal compounds in said bore including a source of purging gas directable into said bore.

4,468,183

APPARATUS FOR THE PRODUCTION OF PARTICULATE METAL

Robert A. Ramser, New Kensington; Daniel R. Barch, Natrona Heights; Kalman E. Buchovecky, Oakmont, all of Pa., and Ray A. Kuchera, Rockdale, Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 31, 1982, Ser. No. 413,513
Int. Cl.³ B01J *2/04*
U.S. Cl. 425—7 **7 Claims**

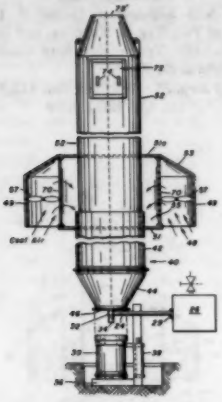
1. An improved apparatus for the production of particulate metal comprising:

(a) a containment vessel having a sidewall extending to a bottom plate;

(b) a source of molten metal external to said vessel;

(c) nozzle means capable of converting said molten metal into metal particles carried by said bottom plate and pro-

viding communication between said vessel and said external source of metal, and



(d) release means associated with said sidewall to inhibit deposition of said metal particles on said sidewall.

4,468,184

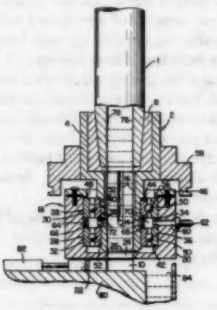
GAS FEED MEANS FOR USE IN CENTRIFUGAL CASTING DEVICES

David L. Rawlings, Bayville, N.Y., assignor to International Hydron Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,626

Int. Cl.³ B28B *17/00*; B29D *11/00*; B29G *7/00*

U.S. Cl. 425—73 **10 Claims**



1. An improved gas feed means for use in a centrifugal casting device employing a rotatable polymerization column adapted for receiving in vertical series a plurality of molds containing a polymerizable or curable composition; said improved gas feeding means comprising a rotatable sleeve member having an upper and lower portion, said upper portion being adapted to accommodate and secure the lower end of said polymerization column for synchronous rotation therewith, said lower portion having gas discharge means for discharging gas into said polymerization column, support means associated with said lower portion of said rotatable sleeve member including gas inlet means for receiving a supply of gas, bearing means disposed between said support means and said sleeve member to allow said sleeve member to be freely rotated with respect to said support means, means for defining a confined zone between said gas inlet means and said gas discharge means, and said gas inlet means, gas discharge means and said confined zone being in gas flow communication such that a gaseous medium fed through said gas inlet means will flow into said confined zone through said gas discharge means and through said polymerization column.

4,468,185

APPARATUS FOR MOLDING A STRAND OF CARAMEL CANDY

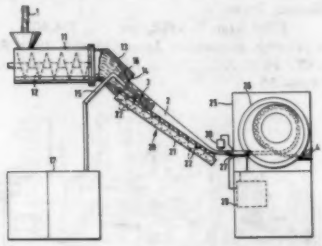
Helmut Jansen, Geldern, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 445,823

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203938; Sep. 22, 1982, 3235024

Int. Cl.³ A23G *3/02, 3/06*

U.S. Cl. 425—133.1 **6 Claims**



1. An apparatus for continuously extruding a food product which is thereafter severed to produce individual edible pieces, comprising a plurality of nozzles, one of said nozzles arranged to control the exterior configuration of said food product and the other of said nozzles arranged to provide an elongated aperture in said food product into which a filling is injected, a conveyor means having a descending gradient, a terminus and a longitudinal extent onto which said food product is fed from said nozzles, a feeder apparatus in proximity to said conveyor means and a molding apparatus arranged to sever said food product into individual edible pieces preparatory for packaging.

4,468,186

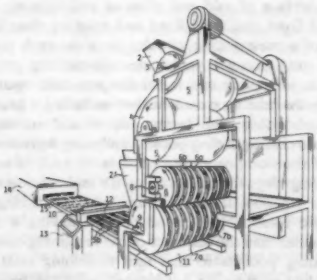
APPARATUS FOR FORMING STRANDS FROM MOLDABLE CONFECTIONARY SUBSTANCE

Helmut Sollich, Kalletal-Talle, Fed. Rep. of Germany, assignor to Sollich KG, Spezialmaschinenfabrik, Bad Salzuflen, Fed. Rep. of Germany

Continuation of Ser. No. 146,765, May 5, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,650

Int. Cl.³ A01J *25/12*

U.S. Cl. 425—294 **15 Claims**



1. Apparatus for forming strands from moldable confectionary substance, comprising: a pair of cooperating axially parallel rollers, each roller having a circumferential

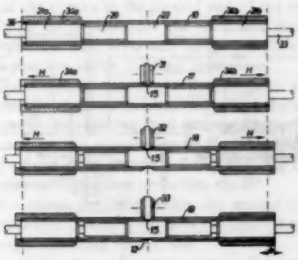
surface provided with grooves running around the circumferential surface, said grooves having bordering sides forming shearing surfaces parallel to each other and perpendicular to the axis of each roller, portions remaining between grooves on one roller meshing in close contact tightly in the grooves of the other roller for subdividing the confectionary substance into individual product strands, said portions and grooves of one roller cooperating sealingly with respectively the grooves and portions of the other roller; and supply means for supplying a web of moldable confectionary substance to the nip between said rollers so as to be formed into strands, said shearing surfaces forming said strands without applying pressure to said strands and web, said web and said strands remaining undeformed and uncompressed during passage between said rollers by being free of pressure applied thereto, said strands being formed with intervals between them, said strands being separated by removing each strand on a level differing from the level whereon the neighboring strand is removed, one of said rollers comprising a form roller with diameter larger than the diameter of the other roller, said other roller meshing with its portions tightly into the grooves of said form roller.

4,468,187

APPARATUS FOR PRODUCING A TUBULAR ARTICLE HAVING AN ANNULAR GROOVE THEREIN

Claes T. Nilsson, Löddeköpinge; Kjell M. Jakobsen, Skanör, and Lars G. Larson, Höör, all of Sweden, assignors to PLM A.B., Malmo, Sweden

Division of Ser. No. 266,849, May 26, 1981, Pat. No. 4,416,927. This application Sep. 7, 1982, Ser. No. 415,014
Claims priority, application Sweden, May 29, 1980, 8004003
Int. Cl.³ B29C *17/02*
U.S. Cl. 425—363 **6 Claims**



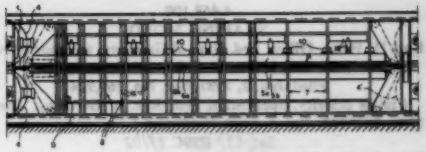
1. A device for producing a tubular article with a peripheral groove from a tubular blank having a wall of essentially amorphous material, comprising fixing means for fixedly engaging the wall of the blank on both sides of a region in which the groove is to be formed and for axial movement in opposite directions while maintaining secure engagement with the wall of the blank to produce axial stretching forces in the blank, and mechanical shaping means for contacting and compressing the wall of the blank in the region in which the groove is to be formed while undergoing movement peripherally around the blank and also perpendicular to the axis of the blank such that said groove is formed in the wall of the blank with gradually increasing depth and the axial stretching forces applied by said fixing means to the material in the bottom of the groove causes the material to yield while its thickness is simultaneously reduced.

4,468,188

BELT-TYPE PARTICLEBOARD PRESS

Klaus Gerhardt, Rheurdt, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 411,109
Int. Cl.³ A23G *1/20*
U.S. Cl. 425—371 **6 Claims**



1. In a belt-type press for making particleboard, including a preliminary station for prepressing a mass of wood particles and binder into a mat, a final station for converting said mat into a rigid particleboard, and an intervening central station wherein said mat is continuously compacted between confronting stretches of a pair of conveyor belts entraining said mat along a straight horizontal path under pressure from an upper platen and a lower platen bracketing said stretches between them, the pressure exerted by said platens upon said mat reaching a peak in an upstream zone, decreasing in an intermediate zone and leveling off in a downstream zone of said path, said platens being mounted on a frame structure with interposition of a set of actuators for generating said pressure,

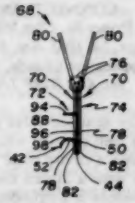
the improvement wherein said frame structure comprises a multiplicity of substantially identical sheet-steel frame elements disposed in parallel vertical planes perpendicular to said path, some of said frame elements standing alone to form single-element supports, other of said frame elements being juxtaposed to form plural-element supports, said single-element supports being disposed in said downstream zone, several of said plural-element supports being disposed in each of said intermediate and upstream zones, said supports being spaced apart along said path by distances increasing progressively from an upstream end of said path to a downstream end thereof, said frame elements being provided with mutually aligned windows traversed by said platens, said stretches and said mat, said actuators being mounted in groups in said windows, the number of actuators per support being greater near said upstream end than near said downstream end.

4,468,189

FIXTURE FOR FORMING ARROW FLETCHING

Richard F. Carella, 35572 Strathcona, Mount Clemens, Mich. 48043

Division of Ser. No. 275,167, Jun. 19, 1981, Pat. No. 4,392,654. This application Mar. 25, 1983, Ser. No. 478,896
Int. Cl.³ B29C *17/02*
U.S. Cl. 425—391 **3 Claims**



1. A fixture for use in heat forming a plastic arrow fletching comprising: a pair of clamp members for clamping an arrow fletching; said clamp members having terminal edges that

clamp the fletching vane adjacent the foot thereof such that the foot is exposed to permit mounting on an arrow shaft after the heat forming; one of the clamp members including an opening; and a former for bending the clamped fletching to a curved shape extending through said opening such that upon heating and subsequent cooling the fletching assumes the curved shape.

4,468,190

SHAPING MOLD

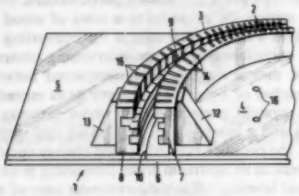
Karl H. Witte, Hilter, Fed. Rep. of Germany, assignor to Maschinen Witte KG, Hilter, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,924

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 3020922; Jun. 3, 1980, 8014748[U]

Int. Cl.³ B29C *17/02*

U.S. Cl. 425—392 **14 Claims**



1. A mold for bending elongated synthetic resin products which are to be bent while soft, said products being in the form of hollow sections of synthetic resin and having a constant cross sectional configuration along the longitudinal length thereof, comprising a pair of elongated mold parts, said mold parts each having opposed complementary faces with contours at least partially conforming to at least parts of said product to be bent, said two mold parts being disposed relative to one another to provide a longitudinal slot between said two mold parts for receiving a drawing tool to draw said product longitudinally through said mold, a support means on which said mold parts are mounted providing for moving at least one of said mold parts relative to the other mold part, said mold parts being constructed and arranged so as to be bendable along the longitudinal axes to effect a change in arcuate configuration, said mold parts being made of a material which facilitates sliding of said synthetic resin product through said mold, said support means supporting said mold parts in fixed spaced apart disposition as said product is pulled longitudinally between said mold parts by said drawing tool as said drawing tool traverses said longitudinal slot to thereby impart to said product an arcuate configuration corresponding to the arcuate configuration of said mold parts.

4,468,191

HYDRAULICALLY ACTUATED INJECTION MOLDING SYSTEM WITH ALTERNATE HYDRAULIC CONNECTIONS

Jobst U. Gellert, 7A Prince St., Glen Williams, Ontario, Canada

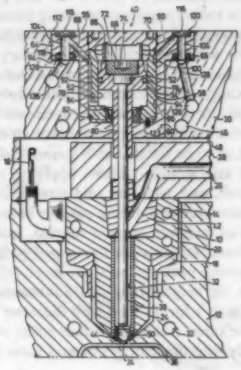
Filed Apr. 14, 1983, Ser. No. 485,024

Claims priority, application Canada, Mar. 24, 1983, 424371

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—564 **9 Claims**

1. In a hydraulically actuated valve gated injection molding system comprising a melt passage which extends from a melt inlet to a gate through a cavity plate leading to a cavity, an elongated valve pin with a driven end and a tip end, and a piston which reciprocates in a cylinder seated in a back plate, the cylinder having at least first and second hydraulic fluid ducts extending therethrough from hydraulic fluid supplies to opposite sides of the piston, the piston being connected to the driven end of the valve pin and hydraulically driven to actuate the valve pin between an open position and a closed position in which the tip end is seated in the gate, the improvement wherein;



each of the first and second hydraulic fluid ducts has inlet connection means whereby it may be connected to a hydraulic fluid supply line extending through either the back plate or a top plate located adjacent to the back plate.

4,468,192

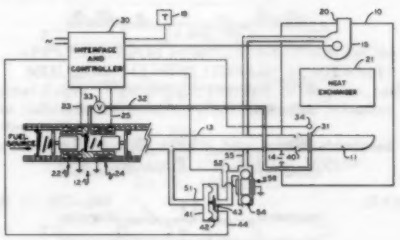
CONTROL SYSTEM FOR CONTROLLING THE FUEL/AIR RATIO OF COMBUSTION APPARATUS

Thomas S. Jaeger, Crystal, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 1, 1983, Ser. No. 509,833

Int. Cl.³ F23M *3/00*

U.S. Cl. 431—20 **2 Claims**



1. In an improvement to a control system for maintaining the fuel/air ratio of an induced draft furnace at a predetermined value by sensing the pressure of the fuel delivered to a burner and a pressure indicative of the induced air and controlling a fuel flow control means to maintain said predetermined value, the improvement comprising,

a single pressure transducer means providing an output indicative of pressure,

valve means for alternatively connecting said transducer means to respond alternately to the pressure of the fuel delivered to the furnace and the sum of the pressure of the fuel and the suction pressure of the induced draft, and

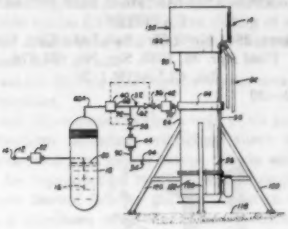
control means connected to respond to said output of said transducer means and to control said fuel flow control means to control the fuel flow to the burner to maintain said predetermined fuel/air ratio for efficient and safe fuel combustion.

4,468,193

STAGED HYDROCARBON COMBUSTION SYSTEM

Gary N. Lawrence, Jenks, and Jerry D. Wilburg, Sand Springs, both of Okla., assignors to McGill Incorporated, Tulsa, Okla.

Filed Mar. 3, 1983, Ser. No. 471,783
Int. Cl.³ F23D *13/20*; F23N *5/18*
U.S. Cl. 431—89 23 Claims



15. A hydrocarbon vapor combustion apparatus for disposal of hydrocarbon vapors comprising:

an elongated stack having a first end, a medial portion, a second end and a centrally disposed passageway extending therethrough, the medial portion having at least a first port and a second port openly communicating with the centrally disposed passageway;

first vapor directing means extending through a portion of the centrally disposed passageway of the stack via the first port for discharging vapors at low flow rates into a combustion zone at the second end of the stack;

first valve means disposed within the first vapor directing means for directing the flow of vapor through the first vapor directing means;

fluid seal means communicating with the first vapor directing means for preventing flashback from the stack upon burning of the vapors at the second end of the stack, the vapors being introduced into the fluid seal means at a position below a fluid level and being withdrawn therefrom at a position above the fluid level;

second vapor directing means extending through a portion of the centrally disposed passageway of the stack via the second port for establishing fluid communication between the first and second vapor directing means and for discharging vapors at intermediate flow rates into the combusiton zone at the second end ofthe stack;

second valve means disposed within the second vapor directing means for directing the flow of vapors through the second vapor directing means; and

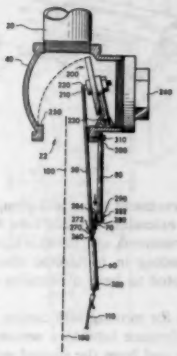
flow rate measuring means for measuring the flow rate of the vapors from the fluid seal means, the flow rate measuring means operably connected to the first and second valve means such that the vapors are selectively discharged at the second end of the stack into the combustion zone via the first and second vapor directing means, the flow rate measuring means operably directing the first valve means in an open mode and the second valve means in a closed mode at low flow rates less than a first determined flow rate value, the flow rate measuring means operably directing the first valve means in a closed mode and the second valve means in an open mode at intermediate flow rates equal to and greater than the first predetermined flow rate and less than a second predetermined flow rate, and the flow rate measuring means operably directing both the first valve means and the second valve means in open modes at high flow rates equal to and greater than the second predetermined flow rate.

4,468,194

AUTOMATIC FLAME SNUFFER FOR STORAGE TANK VENT LINES WITH MANUAL OVERRIDE

Roland A. Chambers, Rawlins, Wyo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Mar. 24, 1983, Ser. No. 478,561
Int. Cl.³ F23Q *25/00*
U.S. Cl. 431—152 5 Claims



1. An improved automatic flame snuffer with manual override for the vent line (20) of a tank (10), said flame snuffer having a valve (200), a fusible link (70), and a counterweight (60) connected to said valve (200) and operatively connected to said fusible link (70) so that said fusible link (70), in the presence of flame, melts thereby allowing said counterweight (60) to close said valve (200) over said vent (20), said improved flame snuffer comprising:

means (40, 24) containing said valve (200) for engaging the end of said vent line (20), said engaging means (40, 24) directing the outlet of said vent line (20) in a downward path (100),

a rod (50) coupled at one end (210) to said valve (200) with the opposing end (260) being attached to said counterweight (60), a first end (270) of said fusible link (70) being attached near the aforesaid opposing end (260) of said rod (50),

a rigid arm (80) attached at one end (300) to said engaging means (40) and attached on its opposing end (290) to the second end (280) of said fusible link (70), said arm (80) supporting said fusible link (70) and said rod (50) in said downward path (100) of said vent outlet (22) so that said fusible link (70) is positioned directly in the path (100) of the flame when fire emanates from said vent (20) in order to melt said fusible link (70) thereby releasing said rod (50) from said arm to close said valve,

means (110) coupled to said rod (50) for selectively applying a force to said fusible link (70) to release said rod (50) from said arm (80) in order to manually close said valve (200) over said outlet (22) when said applied force is greater than a predetermined amount of force, and

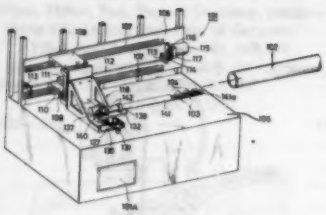
means (120) remote from said vent (20) interconnected with said applying means (110) for receiving said applied force, said valve (200) closing over said outlet (22) when either said fusible link (70) melts or when said fusible link (70) releases from said rod (80) when said applied force exceeds said predetermined force.

4,468,195

THERMAL TREATMENT APPARATUS

Tamotsu Sasaki, Ohme; Tetsuya Takagaki, and Kenichi Ikeda, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,252
Claims priority, application Japan, Oct. 7, 1981, 56-158822
Int. Cl.³ F27B *1/26*; F27D *3/00*; B65G *25/00*
U.S. Cl. 432—36 **13 Claims**



9. A thermal treatment apparatus comprising:

a horizontally extending furnace tube for subjecting wafers to thermal treatment, said furnace tube having an opening;

a carrier extending in horizontal direction and having a portion adapted to have a plurality of wafer jigs placed thereon;

moving means for moving said carrier from a first position outside the furnace tube to a second position inside the furnace tube and from the second position inside the furnace tube to the first position outside the furnace tube;

control means, coupled to said moving means, for controlling movement of said carrier between said first and said second positions in accordance with predetermined several modes.

4,468,196

METHOD OF AND APPARATUS FOR ORTHOPEDIC AND/OR ORTHODONTIC TREATMENT

Duane C. Keller, 62 Grantwood, St. Louis, Mo. 63123

Filed May 24, 1982, Ser. No. 381,379
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—24 **8 Claims**

1. A method of orthodontic and orthopedic treatment comprising the steps of:

installing a body of pliable, hardenable material in the patient's mouth so that with the patient's mouth open, said body of pliable material is in register with selected teeth;

temporarily fixedly orthopedically establishing the proper relation of at least one of the patient's temporomandibular joints which is not in its proper functional orthopedic position;

closing the patient's mouth so that with the orthopedic relationship of the patient's temporomandibular joints properly positioned, said selected teeth form an impression in the body of pliable material; and

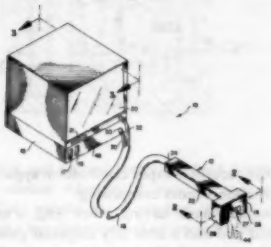
after hardening of the pliable material and after removal of the means utilized to temporarily fixedly establish the proper functional orthopedic position of the temporomandibular joints, utilizing the impression formed in said body of pliable material by said selected teeth serves as a reference relative to which the teeth may be moved to their respective desired positions and to stabilize the position of the temporomandibular joints in their proper functional orthopedic positions during an extended period of treatment.

4,468,197

APPARATUS AND METHOD FOR DETECTING CAVITIES

Wayne Provost, 2541 Neffs Cir., Salt Lake City, Utah 84109

Filed Apr. 26, 1983, Ser. No. 488,676
Int. Cl.³ A61B *1/24*
U.S. Cl. 433—30 **18 Claims**



1. An apparatus for detecting cavities, said apparatus comprising:

a light source which produces a high intensity visible light;

means for projecting the light from the light source onto a tooth;

means for receiving light transmitted through the tooth; and

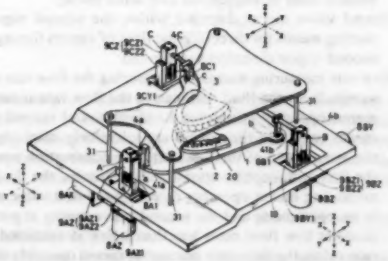
means for producing an image of the transmitted light received so as to provide an image of the tooth.

4,468,198

MANDIBULAR MOTION REPRODUCING DEVICE

Kenzo Kataoka, Otsu; Kazunari Matoba, Nara, and Shinichi Osada, Kyoto, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Apr. 6, 1983, Ser. No. 482,639
Claims priority, application Japan, Apr. 19, 1982, 57-65631
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—63 **4 Claims**



1. A mandibular motion reproducing device comprising:

a mandibular model supporting plate substantially of a single rigid plate;

a mandibular model fixed on said mandibular model supporting plate in proper positional relationship with regard to a dental arch;

a maxilla model fixedly supported above said mandibular model in proper positional relationship with respect thereto;

three marked points set on said mandibular model supporting plate;

three reference points set for reproduction corresponding to said individual marked points set in a fixed positional relationship to said marked points;

joint means for allowing free rotation and bending of said respective reference points for reproduction;

sliding guide means for allowing free sliding of said respective joint means in any of orthogonal three dimensional directions X, Y, Z; and

drive means for driving said respective joint means in any of said directions,

wherein said drive means having a total of six possible driving directions including orthogonal three dimensional directions, said joint means having therein said reference points for reproduction at the center of motion thereof and each thereof follows the movement of other joint means in directions other than those in which it is being driven, and said drive means having inputted thereto position coordinate information obtained in a measuring system and cause said mandibular model to move three-dimensionally with respect to said maxillary model through position control of said individual joint means according to said position coordinate information.

4,468,199

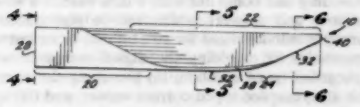
DENTAL WEDGE

Gary Weikel, 1050 Greenfield Dr., El Cajon, Calif. 92021

Filed Jan. 10, 1983, Ser. No. 456,961

Int. Cl.³ A61C 7/00

U.S. Cl. 433—149 **2 Claims**



1. An improvement in a dental wedge for interproximal insertion between two teeth and gums comprising an elongated and porous solid body impregnated with a hemostatic solution including a base portion and a sculptured portion, said sculptured portion having a cross section perpendicular to the longitudinal axis of said elongated solid body, said cross section having a generally trapezoidal shape defined by a minor base forming the top surface of said trapezoidal-shaped cross section and defined by a major base generally forming the bottom flat surface of said trapezoidal-shaped cross section, said minor and major bases being joined by symmetric, slightly concave side surfaces, said side surfaces joining said major base through a flat intermediate portion, said sculptured portion including a tapered tip subportion and a blunted point so that the end of said sculptured portion distal from said base portion is truncated, forming a flat tip end, said major base of said sculptured portion being tapered upwardly through said tip subportion and intersecting said flat tip end, whereby a dental wedge is devised that is easily inserted between said teeth, while preserving the gums, provides a minimum of obstruction to a matrix band disposed on either one of said teeth above said wedge and emits a hemostatic solution to inhibit bleeding of the gums.

4,468,200

HELICAL MANDIBULAR IMPLANT

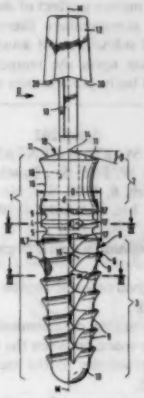
Manfred Münch, Nürtingen, Fed. Rep. of Germany, assignor to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,585

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3241963

Int. Cl.³ A61F 5/04, 1/00

U.S. Cl. 433—174 **4 Claims**



1. A mandibular implant comprising upper, intermediate and bottom portions, said bottom portion being substantially conical and including helical threads formed on the surface thereof beginning at a rounded end tip and spiralling up to and adjacent said intermediate portion for anchoring said implant in the mandibles; said upper portion having a concave lateral surface for receiving an epthelial sleeve and further including a bore formed at its top end to receive a denture support member; said intermediate portion having at least one annular notches formed therein to allow fibers of connective tissue to grow into said notches thus preventing loosening of said implant, said annular expansion member having a diameter less than the diameter of said thread at an upper-most turn located on said bottom portion.

4,468,201

DENTAL ENDOSSEOUS IMPLANTS

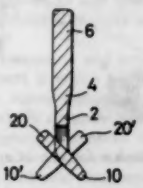
Sekio Fukuyo, 41-6, 1-chome, Shinsakae, Naka-ku, Nagoya-shi, Aichi-ken, Japan

Filed Jun. 13, 1983, Ser. No. 503,901

Claims priority, application Japan, Jul. 7, 1982, 57-118181

Int. Cl.³ A61C 8/00

U.S. Cl. 433—176 **16 Claims**



1. An endosseous implant structure for oral implantology, comprising:

a planar body portion embedded in an alveolar bone to form an artificial tooth root;

a least one neck portion extending from one end of said planar body portion in a direction substantially parallel to the plane of the body portion; and

at least one head portion extending in said direction from one end of said at least one neck portion remote from said body portion and projecting into a oral cavity to form an abutment for an artificial tooth;

said planar body portion including a plurality of leg portions defined by cutouts formed in said body portion, at least said leg portions being made of a metal material exhibiting a thermal shape memory effect of deformation in response to variation in termperature thereof, said leg portions being deformed sidewise, and away from said plane, of said body portion upon the temperature variation after insertion of said body portion into the alveolar bone.

4,468,202

METHOD FOR MAKING DENTAL IMPRESSIONS

Howard Cohen, 2791 W. Fifth St., Brooklyn, N.Y. 11224

Filed Feb. 8, 1982, Ser. No. 346,570
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—199 **16 Claims**

1. A method of obtaining a dental impression comprising the steps of:

retracting the gingival tissue about the teeth of which a mold is to be obtained:

applying a photocurable or chemical curable elastomeric material into the space between the teeth and the gingival tissue in close proximity to the teeth, the impression of which is desired:

curing the elastomeric material to a degree such that it will retain the impression formed therein by the teeth;

applying a second photocurable or chemical curable elastomeric material about the clinical crown of the teeth above and in contact with the subgingivally applied elastomeric material;

curing the elastomeric material to a degree such that it will retain the impression formed therein by the teeth; and

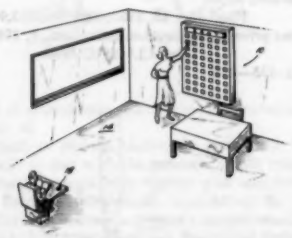
removing the cured elastomeric composite.

4,468,203

CLASSROOM DEMONSTRATION CALCULATOR

Beverly Gimmestad, 1019 College Ave., Houghton, Mich. 49931, and Douglas Brumm, 1140 Rockhouse Rd., Calumet, Mich. 49913

Filed Sep. 6, 1983, Ser. No. 529,939
Int. Cl.³ G09B *5/00, 19/02*
U.S. Cl. 434—228 **3 Claims**



1. A teaching device for use in a classroom, said device comprising

a hand-held size calculator adapted to include a display for showing the numerical output of said calculator and adapted to include a face plate having a plurality of keys which are arranged in a particular pattern and which bear indicia indicating the calculator function of the keys, said calculator including means for producing a signal in response to depression of face plate keys of said hand-held size calculator,

an enlarged keyboard including a plurality of enlarged keys arranged in a pattern simulating the pattern of face plate keys of said hand-held size calculator,

indicia on said enlarged keys simulating indicia on face plate keys of said hand-held size calculator, said indicia being readily readable anywhere within the classroom,

keyboard switches responsive to depression of said enlarged keys,

means for operably connecting said keyboard switches to said means for producing a signal so that said keyboard switches operate said hand-held size calculator in the same manner as face plate keys of said hand-held size calculator,

an enlarged display including numerical characters readily readable anywhere within the classroom, and

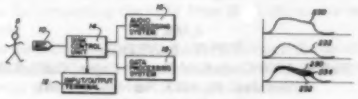
means for operably connecting said enlarged numerical display to said means for producing a signal so that said enlarged display shows the numerical output of said hand-held size calculator.

4,468,204

PROCESS OF HUMAN-MACHINE INTERACTIVE EDUCATIONAL INSTRUCTION USING VOICE RESPONSE VERIFICATION

Brian L. Scott, and William D. Wagers, Jr., both of Denton, Tex., assignors to Scott Instruments Corporation, Denton, Tex.

Filed Feb. 25, 1982, Ser. No. 352,115
Int. Cl.³ G09B *7/02*
U.S. Cl. 434—309 **14 Claims**



1. A method of human-machine interactive instruction with the aid of a digital computer, comprising the steps of:

(a) providing said computer with a data base of a series of questions and answers which can be reproduced and thereafter individualized for student use, by an instructor sequentially (i) providing the digital computer with a keyboarded typed question, (ii) providing the computer with a keyboarded typed correct answer, and (iii) speaking the correct answer a plurality of times to generate relational signals for a master template of the correct answer in digital form, and (iv) said computer correlating the master template with the corresponding keyboarded typed correct answer;

(b) providing a human-machine interactive tutorial step by, for a plurality of questions and answers in said data base, sequentialy (i) displaying a typed question, (ii) displaying the corresponding correct typed answer, (iii) initiating the articulation of the correct answer by a student, (iv) processing the so-spoken answer by converting it from an audio signal into relational signals in digital form, (v) determining whether the processed spoken answer in digital form corresponds to the master template for that answer, and (vi) adjusting the master template to individualize it for the student if the processed spoken answer in digital form does not correspond to the master template; and

(c) providing a human-machine interactive instruction test step by, for each question presented to the student in step (b), (i) displaying a typed question, (ii) initiating the articulation of an answer thereto, (iii) processing the so-spoken answer by converting it into relational signals in digital form, (iv) performing a voice verification step by comparing the processed spoken answer in digital form to the

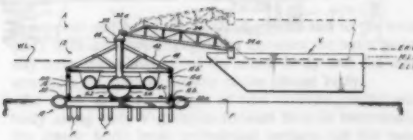
adjusted master template generated in step (b) (vi) to determine whether the processed spoken answer is the correct answer, (v) displaying an "answer correct" message along with the correct answer and proceeding to the next question in the plurality if the processed spoken answer in digital form is the correct answer, and (vi) displaying an "answer wrong" message along with the correct answer and repeating steps (c) (i)–(iv) a predetermined number of times if the processed spoken answer in digital form was not the correct answer.

4,468,205

APPARATUS FOR SINGLE POINT MOORING

Kristen I. Pedersen, Houston, Tex., assignor to Sofec, Inc., Houston, Tex.

Filed Jan. 13, 1983, Ser. No. 457,677
Int. Cl.³ B63B *21/50*
U.S. Cl. 441—5 **4 Claims**



1. Apparatus adapted for mooring a floating marine vessel to the ocean floor in an area of relatively shallow water depth, including:

a mooring base for securing to the ocean floor at a desired location for mooring the floating marine vessel,

a mooring buoy structure having a main body portion and a marine vessel attachment portion for securing with the marine vessel, said main body portion having supporting buoyancy tanks which are submerged well below the surface wave zone, said marine vessel attachment portion rotatably mounted with the main body portion above the water level to enable the moored floating marine vessel secured therewith to swing about said main body portion of said mooring buoy structure to minimize the effects of wind, tide or waves on the marine vessel;

a plurality of attachment members disposed in a substantially parallel relationship for operably connecting said main body portion of said mooring buoy structure to said base while enabling limited relative movement between said base and said buoy structure, each of said arms of a predetermined length for maintaining said main body portion at a depth in the water which places the supporting buoyancy tanks well below surface wave action and tidal water level variations so as to induce a constant tension loading in the attachment arms to provide a steady vessel position restoring force to said main body portion of the buoy structure;

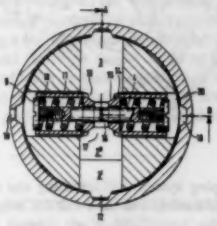
said main body portion of said mooring buoy structure having a ring-shaped base member and a plurality of radial support members, said radial support members secured at one end with said base member and extending upwardly and inwardly to form an apex to provide a generally conical shaped frame for said main body portion.

4,468,206

TORQUE-LIMITING CLUTCH

Paul Herchenbach, Ruppichteroth, and Mathias Konrad, Troisdorf, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH

Filed Feb. 2, 1983, Ser. No. 463,268
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205513
Int. Cl.³ F16D *7/00*
U.S. Cl. 464—37 **17 Claims**



1. A torque-limiting clutch comprising:

a clutch sleeve having clutch engaging means;

a clutch hub adapted to be placed in torque-transmitting engagement with said clutch sleeve;

a plurality of clutch engagement members mounted in said clutch hub and radially movable between a clutch-engaged position and a clutch-disengaged position to bring said clutch hub and said clutch sleeve into and out of torque-transmitting engagement;

said clutch engagement members each having radially innermost and radially outermost ends, with said outermost ends being formed with complementary clutch engaging means adapted to engage said clutch engaging means when said engagement members are in said clutch-engaged position;

a plurality of cam members mounted in said clutch hub engaging said innermost ends of said clutch engagement members and radially movable to drive said clutch engagement members into said clutch-engaged position;

spring means biasing said cam members in a direction to drive said engagement members toward said clutch-engaged position, said cam members being movable against the biasing force of said spring means to enable said engagement members to move to said clutch-disengaged position; and

cam surface means formed on said innermost ends of said engagement members at which said cam members abut, said cam surface means comprising first cam surface means arranged to be in abutment with said cam members which said engagement members are in said clutch-engaged position and second cam surface means arranged to be in abutment with said cam members when said engagement members are in said clutch-disengaged position;

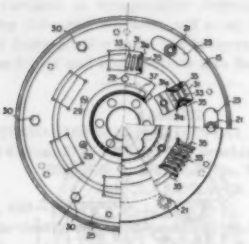
said first and said second cam surface means extending obliquely relative to the radial direction of movement of said cam members, said second cam surface means extending relative to said radial direction of movement at a steeper angle than said first cam surface means.

4,468,207

SYSTEM FOR REDUCING VIBRATION IN A VEHICLE PROVIDED WITH AN INTERNAL COMBUSTION ENGINE

Akio Yoshida, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 6, 1979, Ser. No. 45,940
Claims priority, application Japan, Mar. 30, 1979, 54-37918
Int. Cl.³ F16D *3/14*
U.S. Cl. 464—65 **4 Claims**



1. A damping system for reducing the magnitude of vibration which is transmitted to a vehicle wheel mechanism, in a vehicle of the type having an internal combustion engine which is provided with an output shaft, and a drive train having a first end adapted to be connected to the wheel mechanism for producing a rotational motion of the wheel mechanism, the damping system being arranged between the output shaft and the drive train, the damping apparatus comprising:

first and second inert bodies arranged on a common axis of rotation and facing each other with a small gap therebetween, said first inert body being fixedly connected to the output shaft of the engine, said second inert body being fixedly connected to a second end of the drive train, said second end being disposed away from the wheel mechanism, a sum of values of the moments of inertia of said first and second inert bodies being maintained at a constant value, and;

damping means arranged between said first and second inert bodies for generating elastic and frictional forces between said first and second inert bodies, wherein a first total moment of inertia, on one side of the damping means, including said first inert body and the engine, is maintained substantially equal to a second total moment of inertia on the other side of the damping means, including said second inert body and the drive train.

4,468,208

TRANSMISSION DEVICE

Pierre Randelli, 14 Avenue du Trayas, 13008 Marseille, France

Filed Oct. 22, 1981, Ser. No. 314,040
Claims priority, application France, Oct. 24, 1980, 80 22974
Int. Cl.³ F16C *1/04*
U.S. Cl. 464—117 **10 Claims**

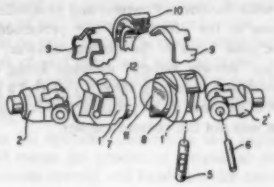
1. A flexible transmission device capable of use along different angles of curvature, said device comprising:

(a) at least two joint mountings, each of said mountings comprising two pairs of elements, each pair of elements having an outer element pivotally connected to an inner element, each inner element having a reduced diameter and portion terminating in an attachment ridge, the ridges of each pair of elements having symmetrical configurations which are adapted to mate with each other;

(b) bearing means positioned about said ridges when said ridges are mated;

(c) a single flexible sheath positioned about all of said bearing means; and

(d) a single, jointless rod for attaching two adjacent mountings, wherein said mountings and said rods together com-



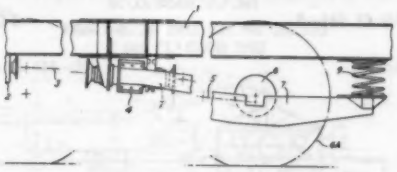
prise means for flexing said device homokinetically over a variety of different angles.

4,468,209

VEHICLE TRANSMISSION SYSTEMS

Richard T. Knowles, Cirencester, England, assignor to Quest 80 Limited, Wiltshire, England

Filed Sep. 27, 1982, Ser. No. 424,752
Claims priority, application United Kingdom, Feb. 11, 1982, 8203950
Int. Cl.³ F16D *3/02*
U.S. Cl. 464—180 **10 Claims**



1. A vehicle transmission system for a vehicle having a vehicle main frame, a subframe joined to said main frame, drive wheels joined to said subframe, means, joined to said wheels, for driving said wheels, and a transmission bush coupling having a flexible diaphragm and inner and outer supporting face members, said diaphragm being clamped between the inner and outer supporting face members and wherein one of the supporting face members is coupled to the vehicle main frame and the other of the supporting face members is coupled to the subframe such that acceleration and braking forces generated by said drive wheels are transmitted to said vehicle main frame.

4,468,210

COMPOSITE PLASTIC PULLEY

Ben O. McCutchan, Jr., Massillon, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Filed Jun. 12, 1981, Ser. No. 273,237
Int. Cl.³ F16H *55/36, 55/48*
U.S. Cl. 474—170 **1 Claim**

1. In a composite plastic pulley of the type having belt-engaging grooves, in which the pulley has a metal body and a molded plastic annular grooved body supported on the metal body, in which the metal body has hub means concentric about a central axis passing through the center of said hub means for mounting the pulley for rotation, in which said metal body has a cylindrical wall concentric about said axis and connected with said hub means, and in which said molded plastic body is attached to said wall; wherein the improvement comprises:

(a) the metal body cylindrical wall having a circular edge at one end and an annular shoulder at the other end of said cylindrical wall, said shoulder being connected completely circumferentially with said hub means;

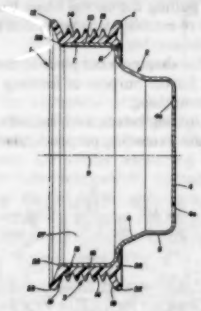
(b) said cylindrical wall having an uninterrupted outer gen-

erally cylindrical surface extending between said circular end and said annular shoulder;

(c) said molded plastic annular body being solid throughout and having an uninterrupted inner generally cylindrical surface complementary to said metal wall cylindrical outer surface;

(d) said annular plastic body having a radially inwardly extending annular flange at one end of the plastic body inner cylindrical surface and having an annular inturned shoulder at the other end of said inner cylindrical surface complementary to said metal body annular shoulder;

(e) the inturned flange and inturned shoulder of said plastic body as molded, respectively, engaging the circular edge and annular shoulder of said metal body cylindrical wall



to support and bond the plastic body on and to the metal body with interface engagement between the outer generally cylindrical surface of the metal body and the inner generally cylindrical surface of the plastic body;

(f) the outer annular portion of said molded plastic solid body aving poly-V-grooves formed therein surrounding the plastic body inner cylindrical surface and the metal body cylindrical wall, said poly-V-grooves being defined by a series of outwardly opening v-shaped grooves located between a pair of spaced belt retaining annular flanges with said flanges extending radially outwardly beyond crests of said V-shaped grooves; and

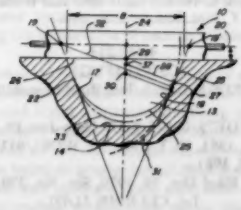
(g) said plastic body being molded from high temperature, reinforced lastic of one of the class consisting of thermoplastics and thermosetting plastics.

4,468,211

TOOTHED BELT MANUFACTURE

Takeshi Hoshiro, and Katsuo Kanamori, both of Kobe, Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Nov. 12, 1981, Ser. No. 320,594
Int. Cl.³ F16G *1/28*; F16H *7/02*
U.S. Cl. 474—205 **12 Claims**



1. For use with a toothed pulley wherein the confronting flank surfaces of successive teeth are planar defining a groove having an included angle of 2θ and opening radially outwardly to a pulley circumferential surface, said groove further defining a flat bottom surface at the inner end of said flank surfaces, an improved toothed belt comprising

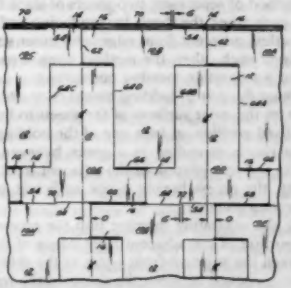
a body portion provided with a longitudinal outer tensile member at the belt pitch line, and a plurality of longitudinally spaced teeth arranged to be successively received in the grooves of the pulley, each of said teeth being defined by transverse planar leading and trailing flank surfaces defining an included angle of substantially 2θ and having an inner end, and a tip surface extending between said inner ends of said belt flank surfaces of the tooth, said inner end of each of the planar flank surfaces in cross section being located at a point of intersection of a line perpendicular to the flank surfaces and crossing the radial centerline of the groove in the portion thereof defined radially outwardly by an outer point at the tooth root and radially inwardly by an inner point spaced inwardly from said outer point by a distance $0.5B\tan\theta$, where B is the width of the belt tooth at the tooth root, each of the leading and trailing portions of said tip surface in cross section defining a circular segment centered on said intersection point and having a radius equal to the length of said line perpendicular to said flank surface whereby said teeth have improved engagement and disengagement relative to the pulley groove surfaces in drive operation thereof.

4,468,212

METHOD OF NESTING MULTIPLE PAPERBOARD CARTON BLANKS

Frederick R. Jennings, Cupertino, Calif., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Division of Ser. No. 113,487, Jan. 21, 1980, Pat. No. 4,300,716.
This application Aug. 13, 1981, Ser. No. 292,658
Int. Cl.³ B31B *1/74, 1/16*
U.S. Cl. 493—52 **3 Claims**



1. A method of nesting multiple carton blanks upon a web of sheet stock from which said carton blanks are derived to optimize the utilization of sheet stock, each of said carton blanks have a substantially T-shaped configuration composed of an elongate central portion and a pair of end panels extending outward from one end of said elongate central portion with a protruding section on an end panel, said method comprising the steps of:

arranging a first group of carton blanks in a side-by-side orientation along the length of said web of sheet stock, opposite end panels of adjacent carton blanks within said first group being abutted along their outboard edges (62);

arranging a second group of carton blanks in a side-by-side orientation along the length of said web of sheet stock, opposite end panels of adjacent carton blanks within said second group being abutted along their outboard edges, said second group of carton blanks being inverted with respect to said first group of carton blanks; and

interspersing said second group of carton blanks with said first group of carton blanks so that said elongate sections

of each of said carton blanks in said second group lie between the elongate sections of an adjacent pair of carton blanks in said first group;

arranging third and fourth groups of carton blanks abutted and interspersed identically with said first and second groups; and

abutting a first row of carton blanks formed by said first and second groups with a second row formed by said third and fourth groups such that said protruding sections on said end panels of one row interleave with the protruding sections of the second row.

4,468,213

METHOD AND APPARATUS FOR SEPARATING FROM EACH OTHER TWO THIN, SLACK SHEETS OF MATERIAL

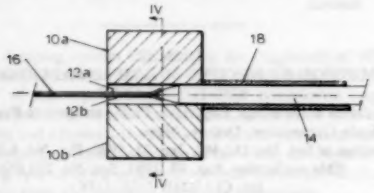
Albertus B. Termaat, Zandvoort, Netherlands, assignor to Colpitt B.V., Netherlands

Filed Dec. 2, 1981, Ser. No. 326,882

Claims priority, application Netherlands, Dec. 9, 1981, 8006686

Int. Cl.³ B65B *43/34, 43/36, 61/00*

U.S. Cl. 493—213 **9 Claims**



1. A method of separating two sheets of slack flexible material from each other, the sheets having facing surfaces contacting each other, adjacent front edges and outer surfaces facing outwardly of each other, the method using a pair of holding blocks and a separating member comprising:

positioning the pair of holding blocks over and into engagement on the outer surfaces of the sheets to hold the sheets in a fixed position, at least one of the holding blocks having a recess extending in a space between the holding blocks and to a portion of the adjacent front edges of the sheets, the recess having a size sufficient to permit the separating member;

moving the separating member into the recess and against the portion of the adjacent front edges of the sheets and between the adjacent front edges of the sheets whereby a space is opened between the sheets in the recess;

the separating member and the recess being elongated and a sleeve being provided over the separating member and movable with respect to the separating member; and

blowing fluid into the sleeve for aiding in the separation of the sheets.

4,468,214

METHOD AND APPARATUS FOR SHAPING A RECTANGULAR CARTON BLANK

Bruno Gründler, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 11, 1982, Ser. No. 377,047

Claims priority, application Switzerland, May 12, 1981, 3083/81

Int. Cl.³ B31B *1/78, 5/26*

U.S. Cl. 493—310 **8 Claims**

1. Method for shaping a cut piece formed into a rectangular carton blank for the purpose of forming straight edges and flat side walls, comprising the steps of: placing carton blanks into respective folding boxes, each comprising a rear wall and two side walls; sequentially moving the folding boxes with the carton blanks into two folding stations operating in a mirror-image arrangement; and, in each said folding station

(a) deforming the carton blank into a prism having a parallelogram shaped base surface, with one edge of said prism forming an angle remaining in the folding box and the diagonally opposite edge being pivoted out of the folding box in the direction toward the other folding station;

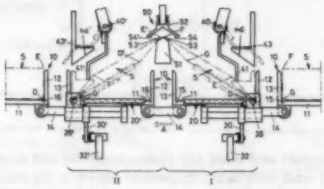
(b) pressing said one edge remaining in the folding box so as to press the adjacent side walls at least approximately into mutual contact;

(c) pressing said diagonally opposite edge pivoted out of the folding box until the adjacent side walls are likewise at least approximately superposed; and

(d) thereafter pulling the carton blank back into the folding box so as to re-establish side walls that are aligned at right angles to one another.

4. Apparatus for shaping a cut piece formed into a rectangular carton blank for the purpose of forming straight edges and flat side walls comprising:

a plurality of folding boxes, each including a back wall and two side walls extending perpendicular to said back wall,



and with the interior edge between said back wall and each said side wall being concave so as to form a folding edge,

a conveyor on which said folding boxes are mounted for moving said folding boxes stepwise to first and second folding stations which are arranged in a mirror-image manner; and

each of said folding stations including finger means, pivotally mounted for lateral movement toward the interior of the one of said folding boxes in the respective said folding station, for exerting pressure on an edge of a carton blank in said one of said folding boxes to pivot the carton blank, a stamping die mounted for lateral movement into said one of said folding boxes so as to cooperate with an associated one of said folding edges to press the edge of a pivoted carton blank which remains in the folding box, a counterholder and an associated stamping plate disposed adjacent the holding box and positioned so as to receive the edge of a carton blank pivoted out of the holding box and to press the edge pivoted out of the folding box, and at least one pivotally mounted clamp means for clamping a side of a carton blank to retract same into said folding box.

4,468,215

CENTRIFUGE

Otto Wimmer, 8399 Sulzbach/Inn, Bundesrepublik, Fed. Rep. of Germany

PCT No. PCT/DE79/00122, § 371 Date Jun. 19, 1981, § 102(e) Date Jun. 9, 1981, PCT Pub. No. WO81/01113, PCT Pub. Date Apr. 30, 1981

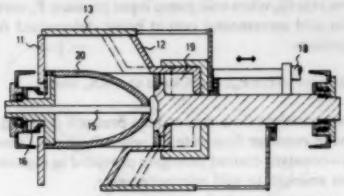
PCT Filed Oct. 19, 1979, Ser. No. 270,527

Int. Cl.³ B04B *11/00*

U.S. Cl. 494—48 **6 Claims**

1. A centrifuge for treating material and, in particular, a centrifuge of the tubular conifuge type for the purification of liquids and for the concentration of sludge comprising a centrifuge drum; said drum consisting of a first drum halve, a second

drum halve and a cylindrical shell disposed between said first and said second drum halves and forming with said drum halves an inner drum space for receiving materials to be treated, means for mounting said drum for rotation about a fixed axis, said means including an axial passage opening into said inner drum space for introduction of material to be treated into said drum space and a radial passage exiting from said



inner drum space for extraction of liquid material from said inner drum space, said cylindrical shell being axially displaceable for opening of said inner drum space to allow extraction of solid material, means for axially displacing said cylindrical shell, said first drum halve being axially displaceable relative to said shell and to said second drum halve during the run of the centrifuge for reducing the volume of the inner drum space and means for axially displacing said first drum halve.

4,468,216

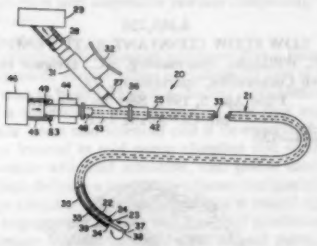
IRRIGATION SUCTION CATHETER

Rudolph Muto, 24 Williams St., Andover, Mass. 01810

Filed May 20, 1982, Ser. No. 380,053

Int. Cl.³ A61M *3/00*

U.S. Cl. 604—43 **7 Claims**



1. An irrigation suction catheter comprising:

a flexible, elongated suction tube of predetermined diameter and length having a distal end with a debris receiving suction inlet opening extending transversely across the terminal tip thereof, a proximal end connected by one branch of a Y coupling to a source of vacuum and a thumb operable aperture member located near said proximal end, between said vacuum source and said Y coupling for controlling the application of suction at said inlet opening and;

a flexible elongated liquid irrigation tube of predetermined diameter substantially less than the diameter of said suction tube, said liquid irrigation tube being sleeved within, and substantially coaxial with, said suction tube to form therebetween an annular suction passage, said liquid irrigation tube being of greater length than the length of said suction tube and having a distal end, with a liquid outlet opening extending transversely across the terminal tip thereof, said tip projecting a spaced distance in front of, and beyond, said suction inlet opening;

said projecting distal end of said irrigation tube forming an annular debris receiving suction inlet therearound and being freely bendable, and sidewise movable therein to clear said inlet of foreign material and avoid plugging of said annular opening and passage;

said liquid irrigation tube having a proximal end extending through the other branch of said Y coupling to a finger grip and thence to a source of liquid under pressure;

pressurized liquid discharge from said liquid outlet simultaneously with application of suction in said debris-receiving inlet creating a vortical circulation, in a cavity in which said catheter is inserted, to dislodge particles for suction removal.

4,468,217

SURGICAL SUCTION TIP WITH FILTER

Kenneth M. Kuzmick, 2596 Old Military Trail, West Palm Beach, Fla. 33409, and William E. Anspach, Jr., 12158 Edgewater Dr., Lake Park, Fla. 33403

Filed Jul. 9, 1982, Ser. No. 396,945

Int. Cl.³ A61M *31/00*

U.S. Cl. 604—48 **6 Claims**

1. A suction tip for removing fluid and solid material from a body cavity during a surgical operation comprising an elongated housing, said elongated housing being formed by a first and second hollow elongated tapered section means connected together by a short hollow conical section means, said housing including a suction opening at the end of said second hollow elongated tapered section means and said first hollow elongated tapered section means forming a filter receiving handle sleeve means at the other end, said filter receiving handle sleeve means having an inner surface and an open end, an inner removable filter means being positioned within the inner surface of said filter receiving handle sleeve means, said inner removable filter means having a cylindrical filter with guide means on its end within said inner surface of said filter receiving handle sleeve means, said guide means comprising equally spaced guide flanges extending radially outwardly from said cylindrical filter towards the inner surface of said filter receiving handle sleeve means adjacent said short hollow conical section means, said guide flanges guiding the end of said cylindrical filter and positioning it within said filter receiving handle sleeve means, means sealing said inner removable filter means with the inner surface of said filter receiving handle sleeve means, quick connect-disconnect means connecting said inner removable filter means to said filter receiving handle sleeve means, said inner removable filter means having a tubular portion extending through said open end of said filter receiving handle sleeve means externally of said filter receiving handle sleeve means to direct fluid and filtered solid material therefrom.

4,468,218

VENTILATION TUBE FOR THE MIDDLE EAR AND METHOD OF IMPLANTING SAME

Beverly W. Armstrong, 3034 Hampton Ave., Charlotte, N.C. 28207

Filed Sep. 24, 1982, Ser. No. 422,866

Int. Cl.³ A61F *11/00*; A61M *27/00*

U.S. Cl. 604—49 **20 Claims**

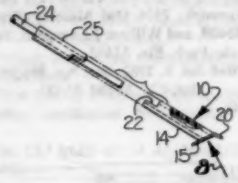
1. A ventilation tube adapted to be inserted through and implanted in the tympanic membrane to ventilate and drain the middle ear, and characterized by the ability to be readily inserted through the membrane without excessive trauma, and comprising

an elongate tubular body, and

a flange mounted at one end of said body, with said flange defining a plane which is inclined at an angle of at least about 30 degrees with respect to a plane disposed perpen-

dicular to the axis of the body, and with said flange including an incision entry guide portion extending forwardly in a direction substantially parallel to the axis of the body and from the most forward portion of the remaining portion of said flange, and whereby during the tube insertion procedure, the incision entry guide portion is adapted to initially enter the incision in the tympanic membrane and guide the remainder of the flange therethrough without significant trauma.

15. A method of implanting a ventilation tube in the tympanic membrane to ventilate and drain the middle ear, and comprising the steps of



providing a ventilation tube comprising an elongate tubular body, a flange mounted at one end of said body, and with said flange including an incision entry guide portion extending forwardly in a direction substantially parallel to the axis of the body and from the remaining portion of the flange,

forming an incision in the tympanic membrane, and

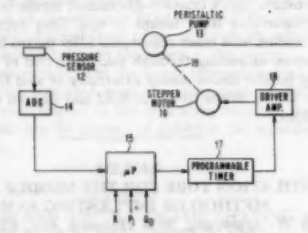
inserting the flanged end of the tube through the incision so as to be disposed in the middle ear medially to the membrane, and including initially guiding the incision entry guide portion through the incision so that the flange may be guided therethrough with a minimum of trauma.

4,468,219

PUMP FLOW RATE COMPENSATION SYSTEM

Dennis R. George, Hamilton Square; Michael J. Steinmetz, Jackson, and Robert A. Weber, Plainsboro, all of N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1983, Ser. No. 563,718
Int. Cl.³ A61M *1/03*
U.S. Cl. 604—66 **9 Claims**



1. A system for setting the speed of a peristaltic pump when the pump input pressure P_o varies from zero said pump having a pressure vs flow rate characteristic which includes a family of curves each of which, for pressures equal to and greater than zero, exhibits a constant or increasing flow rate with increasing pressure and, for pressures less than zero, exhibits a linearly decreasing flow rate with decreasing pressure over at least a portion of said pressures less than zero comprising:

means for sensing said pump input pressure P_o when it varies from zero and providing an analog output representative thereof,

means for converting said analog output into digital form,

microprocessor means connected to said means for converting for providing an incremental output $P_i/(P_i-P_o)$ when P_o is negative or an incremental output $P_i/(P_i+P_o)$ when P_o is positive in digital form which is representative of the amount by which the speed S_o of said pump is changed to provide another speed S which will maintain a constant flow rate Q_o when said pump input pressure P_o varies from zero said incremental output being determined from the equations

$$Q/Q_o=P_i/(P_i\pm P_o),\ Q=KS \text{ and } Q_o=KS_o \text{ where}$$

Q=equivalent flow rate at zero pressure required to provide constant flow rate Q_o when P_o varies from zero,

Q_o=constant desired flow rate provided in digitized form as an input to said microprocessor,

P_i=pressure at which extrapolated linear portions of the curves of the pump characteristic intersect the pressure axis,

P_o=pump input positive or negative pressure provided in digitized form as an input to said microprocessor,

S=speed at which pump must be driven to provide Q_o when P_o varies from zero,

S_o=speed at which pump is driven to provide Q_o when P_o is equal to zero,

K=pump constant provided in digitized form as an input to said microprocessor and,

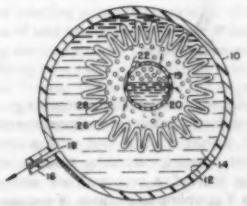
means responsive to said incremental output connected to said microprocessor means for changing the speed S_o of said pump to said another speed S.

4,468,220

LOW FLOW CONSTANT RATE PUMP

Charles E. Willbanks, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 5, 1982, Ser. No. 365,316
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—133 **1 Claim**

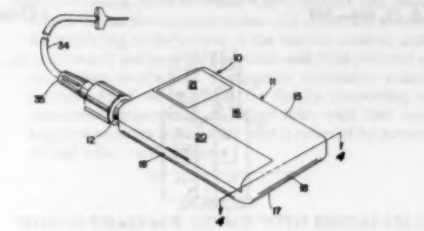


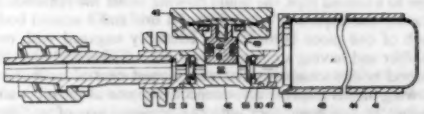
1. A low flow, constant rate pump which comprises a fixed volume container, the inner walls of said container defining a receptacle for a liquid to be dispensed, said container being provided with means to form an unobstructed opening through which said liquid may be caused to flow continuously at a low-flow, constant rate, a propellant chamber within said container formed of a material which is permeable to vapor from a propellant of the liquid-vapor type, a supply of propellant of the liquid-vapor type confined within said chamber, said propellant initially being under pressure sufficient to maintain a major portion thereof in liquid form at normal temperatures, and wherein said propellant chamber within said container is itself encompassed by a flexible diaphragm impermeable to said propellant vapor and to said liquid to be dispensed, thereby separating said propellant vapor from said liquid.

4,468,221
MEDICATION INFUSION PUMP

William B. Mayfield, Costa Mesa, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 252,779, Apr. 10, 1981, abandoned.
This application Jul. 20, 1983, Ser. No. 515,449
Int. Cl.³ A61M 5/20
U.S. Cl. 604—152 12 Claims





1. A medication injection device having a reusable portion that includes an electromagnetic solenoid core, a solenoid coil and means for energizing the solenoid coil, said device further including a disposable portion that is releasably secured to said reusable portion said disposable portion comprising:

a reservoir;

a pump chamber;

an electromagnetic solenoid armature that contacts a first engagement surface when said solenoid coil is energized and that is biased against a second engagement surface that is maintained with respect to said first engagement surface when said solenoid coil is de-energized;

a piston located in said pump chamber and secured to an moveable with said armature, said piston having a first position defining a minimum volume configuration of said pump chamber when said armature is biased against second engagement surface and a second position defining a maximum volume configuration of said pump chamber when said armature contacts said first engagement surface; and

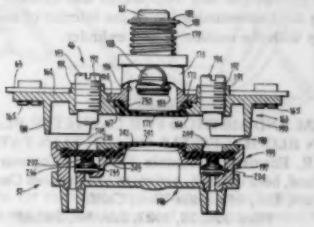
spring means for resiliently biasing said piston such that said piston is urged toward said first position.

4,468,222
INTRAVENOUS LIQUID PUMPING SYSTEM AND METHOD

Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.

Continuation of Ser. No. 868,894, Jan. 12, 1978, abandoned, which is a continuation of Ser. No. 689,115, May 24, 1976, abandoned. This application Dec. 3, 1979, Ser. No. 99,322
Int. Cl.³ A61M 5/00; F04B 9/08, 35/02
U.S. Cl. 604—153 37 Claims

1. In an intravenous liquid pumping system for use with a source of intravenous liquid to be supplied to a patient, a controller, a disposable pump for use with the controller and normally disposed of after a one-time use and clamping means for securing said disposable pump to the controller for easy insertion and removal of the disposable pump, the controller having a controller body forming a chamber with first and second openings in communication therewith, a plunger mounted in said first opening for movement into and out of the chamber between innermost and outermost positions, a flexible membrane carried solely by the controller body to seal said chamber so it is liquid tight, a constant quantity of liquid filling said sealed chamber whereby as said plunger is moved into and out of the liquid the membrane will be moved between extended and retracted positions and motive means for moving said plunger, said disposable pump having a rigid pump body with a pump chamber therein, said pump body having an opening therein in communication with said pump chamber, a flexible membrane carried solely by said pump body, and covering said opening in said pump body, said membrane carried by the pump body being exposed to the atmosphere when it is free of the controller, said pump body having outlet and inlet ports formed therein in communication with the pump chamber, outlet valve means for controlling liquid flow

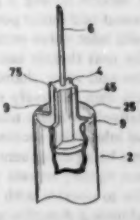


from the pump chamber through the outlet port, inlet valve means for controlling liquid flow into the pump chamber through the inlet port, each valve means including a valve seat and a valve member movable either to an inoperative position spaced from the seat or an operative position in cooperative relationship with the seat, means for biasing each of said valve members to its operative position when the pump is secured to the controller by the clamping means, means adapted to connect the inlet port to the source of liquid and means adapted to connect the outlet port to the patient, said clamping means for securing the disposable pump to the controller including means for positioning the pump so that the flexible membrane carried thereby is in intimate contact with the flexible membrane of the sealed chamber of the controller whereby as the plunger is moved, intravenous liquid is forced through said pump by conjoint movement of said membranes.

4,468,223
SYRINGE

Yoshinori Minagawa, and Katsuhiko Miyaguchi, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1982, Ser. No. 405,145
Claims priority, application Japan, Aug. 6, 1981, 56-123547
Int. Cl.³ A61M 5/00
U.S. Cl. 604—199 5 Claims



1. A syringe comprising:

a hollow cylinder having a front end and an axially out-

wardly extending tip portion formed contiguous and integral with said front end of said cylinder;

a plunger in said cylinder;

a plurality of integrally formed generally L-shaped ribs extending across both the outer surface of said tip portion of said cylinder and the front face of said cylinder for reinforcing said tip portion;

said front end of said cylinder being circumferentially and axially extended to form an annular wall;

a hollow cannula having a base which is embedded in said tip portion, the interior of said cannula communicating with the interior of said cylinder; and

a protector cap snugly fitted on said tip portion to sheathe said cannula, said protector cap being at least partially in contact with said front end of said cylinder;

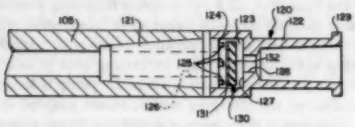
a passage being defined between said protector cap and said tip portion and said front end of said cylinder for providing fluid communication of the interior of said protector cap with the outside of said cylinder.

4,468,224

SYSTEM AND METHOD FOR CATHETER PLACEMENT IN BLOOD VESSELS OF A HUMAN PATIENT

Dieter R. Enzmann, Mountain View, and Ingemar Lundquist, Oakland, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Jan. 28, 1982, Ser. No. 343,435
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—247 **3 Claims**



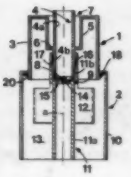
1. A connector assembly in combination with a catheter having a distal end adapted to be inserted into a major blood vessel of a human patient and a proximal end remaining outside said patient, comprising a branching connector having one outlet arm with an outlet port connected to said proximal end of said catheter and at least two inlet arms, each with an inlet port connected to first and second feed lines for introducing first and second liquids into said blood vessel through said catheter, each of said inlet ports having one-way valve means mounted therein, said one-way valve means having entrance and exit ports and means for permitting passage of liquid through said valve mechanism when the liquid pressure at said entrance port of said one-way valve means exceeds the liquid pressure at said exit port of said one-way valve means, each of said one-way valve means comprising generally hollow inlet and outlet valve sections mated to form a hollow valve chamber, said outlet valve section having a plurality of separate abutments disposed around said outlet port and extending into said valve chamber, said inlet valve section having a sealing valve face with an inlet port therein and a disc-shaped valve member mounted within said valve chamber and comprising a sandwich of a relatively thin relatively rigid disc and a relatively thick disc of relatively resilient material with said resilient material facing said inlet valve section, said relatively thin and relatively thick discs being congruent, said relatively rigid disc providing sufficient rigidity to said valve element to enable said one-way valve to operate with relatively high pressure in both the flow admitting direction and the flow blocking direction of the valve, said disc-shaped valve member having planar uninterrupted surfaces facing the inlet port and the outlet port.

4,468,225

DEVICE FOR REGULATING THE LIQUID FLOW IN A PIPE

Patrick Tchéraz, Vandoeuvres, Switzerland, assignor to Etablissement Sideco International, Vaduz, Switzerland

Continuation of Ser. No. 210,640, Nov. 26, 1980, abandoned. This application Dec. 10, 1982, Ser. No. 448,745
Claims priority, application Switzerland, Nov. 27, 1979, 10541/79
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—248 **3 Claims**



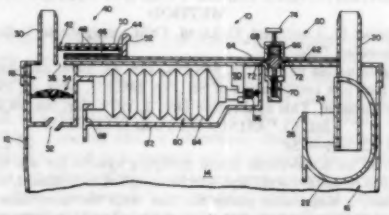
1. Apparatus for regulating the flow of liquid from a first pipe to a second pipe, the liquid flowing under the influence of gravity, the apparatus consisting of a first and a second body each of one piece construction, rotatably engaged with one another and having a common axis, and wherein said first and second bodies comprise first and second central cylindrical flowing means respectively, connected to one of the pipes and having an axis coincident with the common axis of said first and second bodies; said first and second central cylindrical flowing means each comprising an end plate and at least one controlling passage; means for applying said end plates one against the other, the passage through said end plates having substantially the same cross-section for adjusting the flow through them from zero to a maximum when they are coincident, said cross-section being of the same magnitude as half the area of the plate; each of said first and second bodies further comprising an external cylindrical casing integral and coaxial with the respective flowing means and to be taken and actuated with one hand; and engaging means integral with said bodies being provided for maintaining said end plates in their abutting relationship.

4,468,226

SURGICAL DRAINAGE APPARATUS WITH INCREMENTAL SUCTION CONTROL AND INDICATION

Leonard D. Kurtz, Woodmere, and Joseph M. LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Filed Jun. 8, 1982, Ser. No. 386,436
Int. Cl.³ G01L *21/00*
U.S. Cl. 604—321 **15 Claims**



1. A surgical drainage apparatus for draining fluids from the body of a patient, said apparatus comprising:

a container;

a fluid inlet in said container;

a collection chamber formed in said container for collecting fluids received through said fluid inlet;

connection means for connecting said container to a suction source so as to create a suction within said container and thereby draw fluids into said container through said fluid inlet;

manually adjustable, incrementally variable control means for incrementally controlling the amount of suction created within the collection chamber of said container;

indicator means, located within said container and responsive to the suction created within said collection chamber, for providing an indication of the suction created; and

an underwater seal provided between said fluid inlet and said connection means and a manually actuatable negative pressure relief valve means for fluidly connecting said connection means and said fluid inlet such that excess negative pressure in said fluid inlet is relieved by actuation of said relief valve means.

4,468,227

WOUND DRAINAGE DEVICE WITH RESEALABLE ACCESS CAP

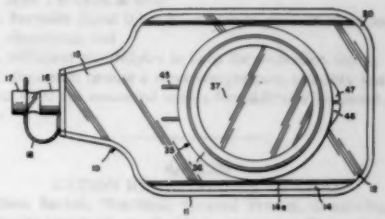
Marvin E. Jensen, Niles, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed May 29, 1981, Ser. No. 268,368

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—327 **1 Claim**

1. A wound drainage device comprising a pouch of flexible fluid-impermeable plastic material having top, bottom, and side wall means; said side wall means being accordion-pleated and providing low resistance to unfolding when said top wall means is lifted away from said bottom wall means; said bottom wall having an enlarged aperture therein and having a flexible barrier panel of gas-permeable liquid-resistant material sealed across said aperture; adhesive means along the bottom wall means for securing said barrier panel about a wound site after an opening to encompass the wound is formed in said panel; said top wall means having an access opening therein overlying said aperture; a flat ring of flexible plastic material circumferentially secured to the outside upper surface of said top wall means about said opening and provided with a plurality of angularly upstanding circumferentially-extending concentric locking ribs; a removable closure cap for said access opening; said cap including a flat rim of flexible plastic material having a plurality of angularly depending circumferentially-extending



locking ribs for releasably and sealingly interlocking with the ribs of said ring when said rim and ring are squeezed together; said ring including an inner portion sealed to said top wall means and a flat outer flange portion unsecured to said top wall means; said angularly upstanding ribs of said ring being provided in the upper surface of said flange portion; and connecting means hingedly connecting said rim of said cap to said flange of said ring for retaining said cap and pouch together when the ribs of said rim and ring are unlocked.

4,468,228

QUATERNARY AMMONIUM COMPOUNDS AND METHOD FOR PREPARATION THEREOF

Drahomir Dvorsky, and Karel Cerovsky, both of Dvur Kralove nad Labem, Czechoslovakia, assignors to Vykumny ustav zuslechtovaci, Dvur Kralove nad Laben, Czechoslovakia

Division of Ser. No. 354,494, Mar. 3, 1982, abandoned. This application Jul. 21, 1983, Ser. No. 516,134

Claims priority, application Czechoslovakia, Mar. 3, 1981, 1537-81; Mar. 20, 1981, 2059-81

Int. Cl.³ D06M *1/00, 13/18, 13/46*

U.S. Cl. 8—188 3 Claims

1. Method for finishing cellulose fibers containing textile material which comprises reacting said cellulose fiber with a compound of the formula

$$[Y - M - Y]^{k+} \frac{k}{n} X^{n-}$$

wherein

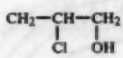
k is an integer of 1–2,

n is an integer of 1–3

X is an anion of a strong acid, and

Y is selected from the group consisting of

(a)



(b)

said group being bound to the nitrogen atoms of a heterocyclic compound, M, comprising a 5 or 6 membered ring with two nitrogen atoms, the individual atoms of the heterocycle having bound thereto at least one substituent selected from the group consisting of hydrogen, alkyl and hydroxyalkyl groups having from 1–4 carbon atoms.

4,468,229

TINTED CONTACT LENSES AND A METHOD FOR THEIR PREPARATION WITH REACTIVE DYES

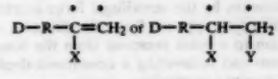
Kai C. Su, Roswell, Ga., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 292,325, Aug. 12, 1981, abandoned. This application Jun. 1, 1982, Ser. No. 382,973

Int. Cl.³ D06P *5/00*

U.S. Cl. 8—507 14 Claims

1. A contact lens colored over at least a portion of its surface, comprising a copolymeric hydrogel material to which at least one reactive dyestuff of the formula



wherein

D is the radical of an organic dyestuff radical;

R is a divalent organic electron attracting group capable of causing electron withdrawal of the C carbon atoms, thus activating the same;

X is hydrogen or halo; and

Y is leaving group;

or mixtures thereof, is covalently bonded external to the polymer backbone by reaction at temperatures up to 40° C. with hydroxyl, amino, amido or mercapto groups present in said polymer, over the colored portion of the lens.

4,468,230

ACID DYE DISPERSIONS

Thomas J. Thomas; Robert G. Hoguet; Charles W. Sandefur, and Dietmar Kalz, all of Summerville, S.C., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1983, Ser. No. 478,953

Int. Cl.³ D06P *67/00*

U.S. Cl. 8—528 39 Claims

1. A non-sedimentating stable aqueous dispersion of a non-metallizable acid dyestuff comprising:

a. between about 10 and 60 weight percent of dyestuffs solids having an average particle size between about 1 and 10 microns and having no substantial portion of particles less than 1 micron in size;

b. between about 0.1 and 10 weight percent of an anionic dispersant; and

c. sufficient electrolytes to keep the dispersion stable;

said dispersion having a room temperature viscosity less than about 4000 cps measured with a Brookfield Viscometer at 12 rpm.

4,468,231

CATION ION EXCHANGE OF COAL

William Bartok, Westfield; Howard Freund, Somerville, and Ronald Liotta, Clark, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 3, 1982, Ser. No. 373,883

Int. Cl.³ C10L *9/06*

U.S. Cl. 44—1 R 9 Claims

1. A one-step ion-exchange method for organically bonding alkali and alkaline-earth metal cations onto coal, which method comprises: slurrying the coal, at a temperature from about 20° C. to about 100° C., with an aqueous solution containing cations of one or more metals selected from the group consisting of alkali and alkaline-earth metals and wherein an oxidizing gas is passing through the slurry.

4,468,232

PROCESS FOR PREPARING A CLEAN COAL-WATER SLURRY

James E. Funk, Alfred Station, N.Y., assignor to Alfred University Research Foundation, Inc., Alfred, N.Y.

Continuation-in-part of Ser. No. 375,183, May 5, 1982, , which is a continuation-in-part of Ser. No. 88,815, Oct. 26, 1979, Pat. No. 4,282,006, which is a continuation-in-part of Ser. No. 957,166, Nov. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,337, Apr. 25, 1977, abandoned. This application Jul. 27, 1983, Ser. No. 517,848

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 15 Claims

1. A process for preparing a clean coal-water slurry, comprising the steps of:

(a) providing a coal-water mixture comprised of from about 60 to about 80 volume percent of solids;

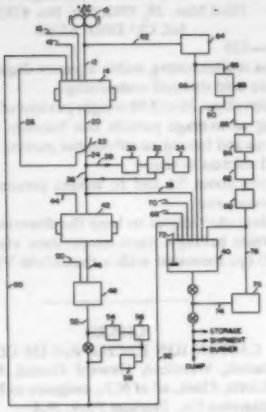
(b) grinding said coal-water mixture until a coal-water slurry is produced wherein:

1. said slurry has a yield stress of from about 3 to about 18 Pascals and a Brookfield viscosity at a solids content of 70 volume percent, ambient temperature, ambient pressure, and a shear rate of 100 revolutions per minute, of less than 5,000 centipoise;

2. said slurry is comprised of a consist of finely divided particles of coal dispersed in water, and said consist has a specific surface area of from about 0.8 to about 4.0 square meters per cubic centimeter and an interstitial porosity of less than about 20 volume percent;

3. from about 5 to about 70 weight percent of said finely divided particles of coal in said water are of colloidal size, being smaller than about 3.0 microns;

4. said consist of finely divided particles of coal has a particle size distribution substantially in accordance with the following formula:



$$\frac{CPFT}{100} = \sum_{j=1}^{k}\left[X_j\left(\frac{D^{Nj} - D_{sj}^{Nj}}{D_{Lj}^{Nj} - D_{sj}^{Nj}}\right)\right]$$

where $\sum_{j=1}^{k} X_j = 1.0$

and where if $D < D_{sj}$ $\left(\frac{D^{Nj} - D_{sj}^{Nj}}{D_{Lj}^{Nj} - D_{sj}^{Nj}}\right) = 0.0$

and where if $D > D_{Lj}$ $\left(\frac{D^{Nj} - D_{sj}^{Nj}}{D_{Lj}^{Nj} - D_{sj}^{Nj}}\right) = 1.0$

wherein:

(a) CPFT is the cumulative percent of said solid carbonaceous material finer than a certain specified particle size D, in volume percent;

(b) k is the number of component distributions in the compact and is at least 1;

(c) X_j is the fractional amount of the component j in the compact, is less than or equal to 1.0, and the sum of all of the X_{fs} in the consist is 1.0;

(d) N is the distribution modulus of fraction j and is greater than about 0.001;

(e) D is the diameter of any particle in the compact and ranges from about 0.05 to about 1180 microns;

(f) D_s is the diameter of the smaller particle in fraction j, as measured at 1% CPFT on a plot of CPFT versus size D, is less than D_L, and is greater than 0.05 microns; and

(g) D_L is the diameter of the size modulus in fraction j, measured by sieve size or its equivalent, and is from about 15 to about 1180 microns;

5. at least about 85 weight percent of the coal particles in the consist have a particle size less than about 300 microns; and

6. the net zeta potential of said colloidal sized particles of coal is from about 15 to about 85 millivolts; and

(c) cleaning said coal.

4,468,233

MOTOR FUEL CONTAINING TERT-BUTYL ETHERS

Hartmut Bruderreck, Gelsenkirchen-Buer; Günter Deininger, Dorsten; Klaus Gottlieb, Herdecke-Ende; Friedel-Heinrich Wehmeier, Bottrop-Kirchhellen, and Manfred Haselhorst, Dorsten, all of Fed. Rep. of Germany, assignors to Veba Oel AG, Gelsenkirchen-Buer, Fed. Rep. of Germany

Filed Apr. 28, 1982, Ser. No. 372,801

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116734

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—56 6 Claims

1. A motor fuel containing tert-butyl ethers comprising 70–95% by volume of hydrocarbon-containing base and 5–30% by volume of an additive which comprises a mixture which contains 5–35% by volume of methyl-tert-butyl ether, 5–40% by volume of isopropyl tert-butyl ether and 5–40% by volume of sect-butyl tert-butyl ether.

4,468,234

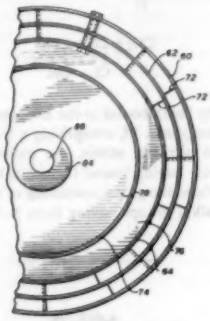
CENTRIFUGAL SEPARATOR

James J. McNicholas, East Brunswick, N.J., assignor to MGI International, Inc., Morris Plains, N.J.

Division of Ser. No. 156,638, Jun. 4, 1980, Pat. No. 4,375,975. This application Feb. 18, 1983, Ser. No. 468,039

Int. Cl.³ B01D *45/00*

U.S. Cl. 55—1 2 Claims



2. A method for removing fluid denser constituents from a fluid stream comprising deflecting said fluid stream to separate large fluid denser constituents from said stream, rotating said fluid stream in a rotating duct having at least three outer, substantially concentric walls tapered toward the axis of rotation of said duct, and a plurality of substantially planar baffles extending radially between said outer walls, said baffles and said walls forming a plurality of concentric axial chambers for the passage of fluid therethrough, said stream being rotated at a speed of rotation sufficient to impel fluid denser constituents outwardly in said fluid to collect on said outer walls and causing said constituents, by the centrifugal force exerted thereon to flow in a direction opposite from the direction of flow of said fluid stream to a point removed from the boundaries of said fluid stream and recovering a constituent-depleted fluid and said fluid denser constituents.

4,468,235

HYDROGEN SEPARATION USING COATED TITANIUM ALLOYS

Eugene F. Hill, 11517 Bianca Ave., Granada Hills, Calif. 91344

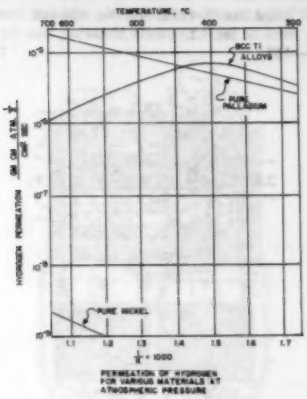
Continuation-in-part of Ser. No. 12,471, Feb. 15, 1979, abandoned. This application Feb. 7, 1983, Ser. No. 464,774

Int. Cl.³ B01D *53/22*

U.S. Cl. 55—16 19 Claims

1. A process for separating hydrogen from other fluids by contacting said fluids with a titanium alloy comprising of the

order of about 13% by weight vanadium, of the order of about 11% by weight chromium, or the order of about 3% by weight aluminum, balance titanium, stabilized in the body centered cubic crystalline form, said alloy having at least one clean surface coated with a metal or alloy based on a member of the class consisting of palladium, nickel, cobalt, iron, vanadium, niobium or tantalum, and allowing hydrogen to permeate the coated alloy at a temperature between about 100° C. and about 500° C.



PERMEATION OF HYDROGEN FOR VARIOUS MATERIALS AT ATMOSPHERIC PRESSURE

4,468,236

APPARATUS AND METHOD FOR MONITORING THE SERVICE LIFE OF ADSORPTION CARTRIDGES USED FOR DESICCATING AND/OR CLEANSING MOIST PRESSURIZED AIR

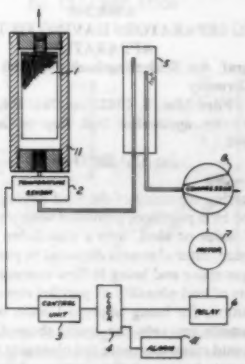
Heinz Bauer, Munich, Fed. Rep. of Germany, assignor to Bauer Kompressoren GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,814

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135732

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—20 **6 Claims**



1. An apparatus for monitoring the service life of a filter cartridge wherein highly pressurized air flows through said filter cartridge from an inlet thereof to an outlet thereof said apparatus comprising a variable speed timepiece, a single temperature sensor disposed at said inlet of said filter cartridge for measuring the temperature of the air entering said filter cartridge, and a control means for said timepiece connected to said temperature sensor whereby said control means adjusts the speed of said timepiece as a function of said temperature of said air entering said filter cartridge.

4. A method for monitoring the service life of a filter cartridge wherein highly pressurized air flows through said filter cartridge from an inlet thereof to an outlet thereof, said method comprising disposing a single temperature sensor at said inlet of said filter cartridge for measuring the temperature of the highly pressurized air entering said inlet of said filter cartridge, and controlling the speed of operation of a variable speed timepiece as a function of said temperature.

4,468,237

PRESSURE SWING ADSORPTION WITH DIRECT AND INDIRECT PRESSURE EQUALIZATIONS

Andrija Fuderer, Antwerp, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 19, 1982, Ser. No. 435,114

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—26 **17 Claims**

1. In a pressure swing adsorption process for the selective adsorption of at least one component of a feed gas mixture in an adsorption system having at least five adsorbent beds, each of which undergoes, on a cyclic basis, higher pressure adsorption, cocurrent depressurization to upper intermediate pressure with release of void space gas from the product end of the bed for direct passage to another bed initially at lower pressure to equalize the pressure therebetween at said upper intermediate pressure, further cocurrent depressurization to lower intermediate pressure with release of additional void space gas from the product end of the bed for direct passage to a different bed initially at lower pressure to equalize the pressure therebetween at said lower intermediate pressure, countercurrent depressurization to a lower desorption pressure and/or purge with release of gas from the feed end of the bed at said lower desorption pressure, partial repressurization to said lower intermediate pressure by the passage of void space gas from a different bed initially at higher pressure directly to said bed to equalize the pressure therebetween at said lower intermediate pressure, further partial repressurization to said higher intermediate pressure by the passage of void space gas from another bed initially at higher pressure directly to said bed to equalize the pressure therebetween at said upper intermediate pressure, and final repressurization from said upper intermediate pressure to said higher adsorption pressure, the improvement consisting essentially of:

(a) upon completion of direct pressure equalization by the passage of void space gas from a bed being cocurrently depressurized directly to another bed in the adsorption system initially at lower pressure for pressure equalization therebetween at said upper intermediate pressure, and prior to the initiation of direct pressure equalization between said bed being cocurrently depressurized and a different bed in said system by the passage of void space gas from said bed being cocurrently depressurized directly to said bed initially at lower pressure for pressure equalization therebetween at said lower intermediate pressure, introducing void space gas released from the product end of said bed being cocurrently depressurized to an external storage tank initially at lower pressure for subsequent pressure equalization usage, said bed and external storage tank being at an intermediate pressure after pressure equalization therebetween, said intermediate pressure being lower than said upper intermediate pressure and higher than said lower intermediate pressure; and

(b) passing said void space gas from said external storage tank at said intermediate pressure to an adsorbent bed in the system initially at lower pressure and being repressurized for indirect pressure equalization therebetween, said indirect pressure equalization of the bed being partially repressurized occurring immediately after partial repressurization to lower intermediate pressure by direct pressure equalization with another bed and immediately be-

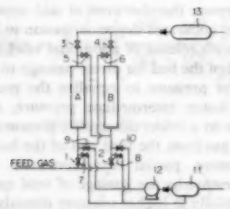
fore partial repressurization to upper intermediate pressure by a second direct pressure equalization with a different bed, said indirect pressure equalization thus being intermediate two direct pressure equalizations in which void space gas is passed directly from said other beds to said bed being partially repressurized to upper intermediate pressure prior to final repressurization to higher adsorption pressure, whereby product recovery and/or purity is enhanced by said inclusion of at least one indirect pressure equalization immediately between two direct equalizations.

4,468,238

PROCESS FOR REMOVING A NITROGEN GAS FROM MIXTURE COMPRISING N_2 AND CO OR N_2, CO_2 AND CO

Sigeo Matsui, Hyogo; Yogo Tukahara; Shigeki Hayashi, both of Shiga, and Masahiko Kumagai, Osaka, all of Japan, assignors to Osaka Oxygen Industries Ltd., Osaka and Kawasaki Steel Corporation, Hyogo, both of, Japan

Filed Jul. 26, 1983, Ser. No. 517,272
Claims priority, application Japan, Jul. 27, 1982, 57-130899
Int. Cl.³ B01D 53/04
U.S. Cl. 55—26 12 Claims



1. A process for separating carbon monoxide from a feed gas comprising carbon monoxide and nitrogen through pressure swing adsorption by using at least two adsorption columns containing an adsorbent exhibiting selective adsorb property to carbon monoxide which comprises:

(i) a step of pressurizing an adsorption column by the feed gas, in which the step (vi) was previously completed;

(ii) a step of introducing the feed gas into the adsorption column, in which step (i) was previously completed, so as to adsorb carbon monoxide on or in the adsorbent until the breakthrough point is reached or until just before that point is reached;

(iii) a step of connecting the adsorption column, in which step (ii) was previously completed, to the other adsorption column in which step (v) was previously completed, to reduce the pressure in the former adsorption column to one atmosphere or a pressure close to it, and to increase pressure in the latter adsorption column;

(iv) a step of purging nitrogen by passing product gas through the adsorption column, in which step (iii) was previously completed;

(v) a step of desorbing carbon monoxide adsorbed on or in the adsorbent of the adsorption column, in which step (iv) was previously completed, by vacuum pump to recover a product gas, and

(vi) a step of connecting the adsorption column, in which step (v) was previously completed, to the other adsorption column in which step (ii) was previously completed to increase pressure in the former column,

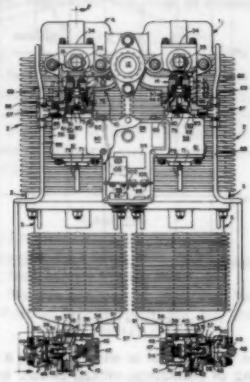
periodically switching the flow between or among said adsorption columns so as to repeat the above steps in all the adsorption columns.

4,468,239

TWIN TOWER ASSEMBLY FOR DECONTAMINATING COMPRESSED GAS

Virgil L. Frantz, Salem, Va., assignor to Roanoke College, Salem, Va.

Filed Jan. 7, 1983, Ser. No. 456,416
Int. Cl.³ B01D 53/04
U.S. Cl. 55—162 18 Claims



1. An assembly for decontaminating compressed gas, comprising twin towers each containing a particulate desiccant and having inlet, outlet, drain and solenoid valves, said inlet and drain valves of each tower each being directly connected to said solenoid valve thereof and actuated respectively to close and open by actuating gas alternately received from and exhausted through said solenoid valve, said assembly including timer means for alternately actuating said solenoid valves and therethrough said inlet and drain valves for causing said towers each to alternate between decontaminating and regenerating cycles and together normally to alternately decontaminate contaminated compressed gas received by said assembly for supplying at an outlet of said assembly a continuous output of decontaminated compressed gas.

4,468,240

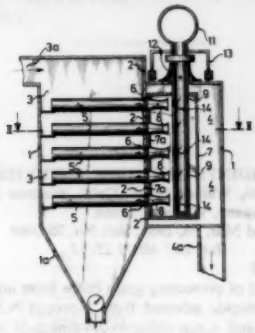
FILTERING SEPARATORS HAVING FILTER CLEANING APPARATUS

Adolf Margraf, Am Schleplingsbach 46, 3060 Stadthagen, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 356,188
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111502
Int. Cl.³ B01D 46/04
U.S. Cl. 55—290 11 Claims

1. In a filtering separator of the kind having a housing which is subdivided by a partition, provided with a plurality of parallel rows of holes or slots, into a dust-laden gas space and a clean gas space, filter elements disposed in parallel rows in said dust-laden gas space and being in flow communication with the holes or slots of said plurality of parallel rows of holes or slots of said partition, for being impinged upon by dust-laden gas from the outside towards the inside thereof, and a chamber provided in said clean gas space for cleansing the filter element surfaces of a row by counterflow action while part of the rows of said partition holes or slots is covered, said chamber having at least one injector arranged to feed compressed air and secondary air to a row of filter elements to be cleansed, and arranged for supplying compressed air to said at least one injector, said chamber being reciprocatingly displaceable within said clean gas space along said partition in periodic and intermittent manner, the improvement which comprises said chamber being closed upon itself with respect to said clean gas

space, and provided with a distributor pipe for supplying compressed air, a control valve is connected to said distributor pipe, and a compressed air reservoir is connected to said control valve for supplying compressed air to said chamber, via said distributor pipe, one surface of said chamber facing towards said partition and covering at least two of the plurality of rows of said partition holes or slots, at least one of the



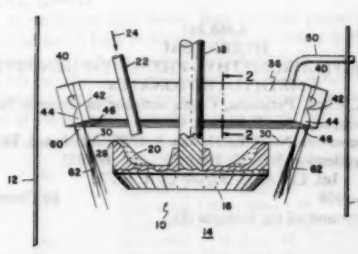
plurality of rows of said partition holes or slots and a respective one of said rows of filter elements being in flow communication therebetween and with the discharge side of said at least one injector acted upon with compressed air, and at least one other row of the plurality of rows of said partition holes or slots and a respective one of said rows of filter elements being in flow communication therebetween and with the suction side of said at least one injector.

4,468,241

METHOD AND APPARATUS FOR FIBERIZING MELTABLE MATERIALS

Robert E. Breidenthal, Jr., 6465 NE. 186th, Seattle, Wash. 98155

Filed Sep. 29, 1982, Ser. No. 427,166
Int. Cl.³ C03B *37/06*
U.S. Cl. 65—5 **37 Claims**



1. In the process of fiberizing a melt comprised of a molten fiberizable material within a gaseous ambient environment and within which a stream of melt is directed laterally at a high angle of incidence into a high velocity stream of gas, the improvement comprising the step of accelerating the gas stream to a supersonic velocity at a position spaced upstream of the location at which the melt is directed thereinto such that the supersonic gas stream is bounded by a shear layer having high velocity gradients therein at said location, whereby the melt is stressed by the high velocity gradients with the sheer layer.

4,468,242

OXIME DERIVATIVES FOR PROMOTING THE GROWTH OF SOYBEANS

Henry Szczepanski, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 69,414, Aug. 24, 1979, Pat. No. 4,269,775.
This application Feb. 26, 1981, Ser. No. 238,345
Int. Cl.³ A01N *43/26, 43/32*
U.S. Cl. 71—88 **3 Claims**

1. A method for increasing the yield in crops of soy beans, which comprises applying thereto an effective amount of phenylacetonitrile oxime-(2'-ethylenedioxyethyl) ether.

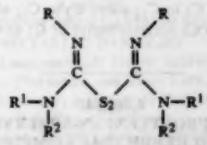
4,468,243

HERBICIDES

Roberto Colle, Milan; Franco Gozzo, S. Donato Milanese, and Ciro Prezioso, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 159,957, Jun. 16, 1980, abandoned.
This application Mar. 9, 1982, Ser. No. 356,420
Claims priority, application Italy, Jun. 15, 1980, 23621 A/79
Int. Cl.³ A01N *41/12*; C07C *149/42*
U.S. Cl. 71—88 **5 Claims**

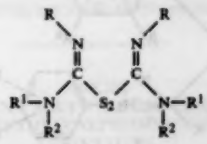
1. A compound stable as a free base and having the formula:



wherein R is phenyl optionally substituted by one or more halogen atoms, one or more alkyl or haloalkyl groups with from 1 to 3 carbon atoms;

R^1 and R_2 are the same or different and each represents an alkyl C_1–C_3, an alkoxyl C_1–C_3, or R^1 or R^2 together with the nitrogen atom to which they are bonded form a piperidino or morpholino radical.

5. A method of fighting infestations of monocotyledons and dicotyledons, characterized in that one or more compounds, either as such or in the form of suitable compositions, are spread on the soil prior to or after the emergence of the plants from the soil, said compounds having the formula:



wherein

R is phenyl optionally substituted by one or more halogen atoms, one or more alkyl or haloalkyl groups with from 1 to 3 carbons;

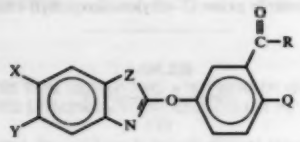
R^1 and R^2 are the same or different and each represents an alkyl C_1–C_3, an alkoxyl C_1–C_3, or R^1 or R^2 together with the nitrogen atom to which they are bonded form a piperidino or morpholino radical.

4,468,244
HERBICIDALLY ACTIVE BENZOXAZOLYLOXY BENZOATE DERIVATIVES

Dennis K. Krass, Canal Fulton, and Sidney B. Richter, Fairlawn, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 8, 1982, Ser. No. 447,838
Int. Cl.³ C07D 263/54; A01N 43/00
U.S. Cl. 71—88 **7 Claims**

1. A compound of the formula:



wherein:

Q is halogen, nitro, or cyano;

X and Y are the same or different and represent hydrogen, halogen, C_1 to C_4 alkyl, C_1 to C_4 haloalkyl, C_1 to C_4 alkoxy, nitro or cyano;

Z is oxygen,

R is —OH, —OM, —OR^1, —SR^1 or —NR^2R^3 wherein M is an agronomically suitable ionic species;

R^1 is C_1 to C_{12} alkyl optionally substituted by hydroxy or C_1 to C_{12} alkoxy, —R^4COOR^5, wherein R^4 is C_1 to C_3 alkylene optionally substituted by C_1 to C_4 alkyl and R^5 is hydrogen, C_1 to C_{10} alkyl or an agronomically suitable ionic species;

R^2 is hydrogen, C_1 to C_{12} alkyl or C_3 to C_{12} alkenyl;

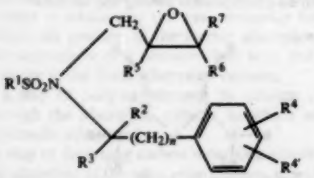
R^3 is hydrogen C_1 to C_{12} alkyl, C_3 to C_{12} alkenyl, C_1 to C_6 alkoxy, C_2 to C_6 alkylcarbamyl or C_1 to C_6 alkane sulfonyl.

4,468,245
N-(2,3-EPOXYPROPYLENE)-N-ARALKYLSULFONAMIDE AND HERBICIDAL COMPOSITIONS CONTAINING THE SAME

Tetsuo Takematsu; Makoto Konnai; Hiroyoshi Omokawa; Koichi Yoneyama, all of Utsunomiya; Kazuyuki Ushinohama, and Seiichi Suzuki, both of Machida, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 15, 1982, Ser. No. 449,989
Claims priority, application Japan, Dec. 29, 1981, 56-210922
Int. Cl.³ A01N 43/36, 43/20; C07D 405/12, 303/36
U.S. Cl. 71—88 **20 Claims**

1. An N-(2,3-epoxypropylene -N-aralkylsulfonamide of formula (I):



(I)

wherein

R^1 is an alkyl group, a haloalkyl group, an aralkyl group or an aryl group which may be substituted,

R^2 and R^3, independently of each other, are a hydrogen atom or an alkyl group,

R^4 and $R^{4'}$, independently of each other, are a hydrogen atom, an alkyl group, an alkoxy group or a halogen atom,

R^5, R^6 and R^7, independently of each other, are a hydrogen atom, an alkyl group, a haloalkyl group or an aryl group, and n is 0 or 1.

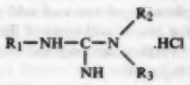
11. A herbicidal composition, which comprises: the N-(2,3-epoxypropylene)-N-aralkylsulfonamide of claim 1 as an active ingredient and an inert carrier.

4,468,246
GUANIDINYL HERBICIDE ANTIDOTES

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 10, 1982, Ser. No. 356,669
Int. Cl.³ A01N 25/32
U.S. Cl. 71—100 **12 Claims**

1. The method of protecting grain crops from injury due to at least one herbicide selected from S-propyl N,N-dipropyl thiolcarbamate and α,α,α-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine, comprising pre-plant incorporation in the soil in which said crop is to be planted, a non-phytotoxic antidotally effective amount of a compound corresponding to the formula



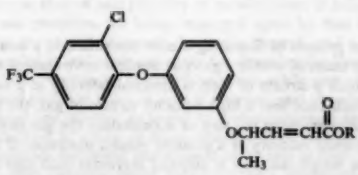
wherein R_1 is chloro substituted phenyl, R_2 and R_3 are individually selected from alkenyl C_3–C_4.

4,468,247
HERBICIDAL 4-[3'-(4''-TRIFLUOROMETHYL-PHENOXY)-PHENOXY]-4-METHYL-CROTONATES

David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 158,039, Jun. 9, 1980, abandoned. This application Jun. 22, 1982, Ser. No. 391,022
Int. Cl.³ A01N 37/06; C07C 69/76
U.S. Cl. 71—108 **10 Claims**

1. A compound of the formula (I):



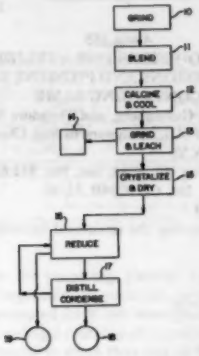
(I)

wherein R is hydrogen, alkyl of 1 to 6 carbon atoms or a monovalent inorganic cation or quaternary ammonium cation.

4,468,248
PROCESS FOR MAKING TITANIUM METAL FROM TITANIUM ORE

Joseph A. Megy, Mission Viejo, Calif., assignor to Occidental Research Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 216,057, Dec. 22, 1980, abandoned. This application Dec. 4, 1981, Ser. No. 327,320
Int. Cl.³ C22B 5/04, 34/12
U.S. Cl. 75—84.4 20 Claims



1. In a process for the reduction of a titanium salt comprising a halide of titanium to titanium metal by contacting said titanium salt in the molten state with a molten alloy of aluminum and zinc to form a solution of titanium metal in zinc the improvement which comprises the step of:

(a) contacting said titanium salt in the molten state with said molten alloy of aluminum and zinc at an elevated pressure of at least about 1.2 atmospheres to thereby increase the solubility of said titanium metal in said solution.

4,468,249
MACHINERY STEEL

Albert L. Lehman, Glenview, Ill., assignor to A. Finkl & Sons Co., Chicago, Ill.

Filed Sep. 16, 1982, Ser. No. 418,800
Int. Cl.³ C22C 38/06
U.S. Cl. 75—124 4 Claims

1. A machinery steel having high isotropic properties characterized by (a) high uniformity of hardenability in the working range, (b) high abrasion resistance, (c) high impact properties, (d) the ability to rapidly cycle between temperature extremes without loss of strength, (e) said steel consisting essentially of the following constituents in weight percent:

C	from about .15 to about .25
Mn	from about .75 to about 1.25
Si	from about .15 to about .50
Ni	from about 1.00 to about 1.50
Cr	from about 1.00 to about 1.50
Mo	from about .35 to about .45
V	from about .04 to about .06
Al	from about .010 to about .035
Cu	up to .35 max.
P	up to .025 max.
S	up to .025 max.
H_2	up to 2.5 ppm max.
O_2	up to 40 ppm max.
Ca	from about 15 ppm to about 50 ppm,
Fe	balance, plus usual non-deleterious impurities,

(f) said steel being further characterized by the presence of Type III round, globular sulfides over Type II stringer type sulfides, and (g) high isotropic RAT properties.

4,468,250
WELDING ADDITIVE MATERIAL SUBSTANTIALLY FREE OF COBALT AND CARBIDE FOR DEPOSIT WELDING

Heinz Schabereiter, Kapfenberg, and Josef Tösch, Bruck an der Mur, both of Austria, assignors to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Feb. 2, 1983, Ser. No. 463,139
Claims priority, application Austria, Feb. 19, 1982, 637/82
Int. Cl.³ C22C 38/04
U.S. Cl. 75—128 A 5 Claims

1. An essentially cobalt and carbide free additive material for deposit welding and forming an additive welding member having metallic and non-metallic components in order to obtain a welding deposit having high abrasion resistance, high corrosion resistance and high inter-granular corrosion resistance in a non-heat treated state, said additive material of said additive welding member related solely to the metallic components thereof consisting essentially of

carbon up to a maximum of 0.15 percent,
silicon in the range of 3.0–10.0 percent,
manganese in the range of 3.0–12.0 percent,
chromium in the range of 22.0–30.0 percent, and
nickel in the range of 7.0–16.0 percent,

each in percent by weight, and the remainder being composed of iron and unavoidable impurities; and

said additive material of said additive welding member yielding a welding deposit having a ferritic-austenitic structure containing ferrite in the range of 40 to 70 percent by weight.

4,468,251
GOLD CONTAINING PREPARATION FOR COATING METALLIC PARTS (II)

Jürgen Hausselt, Langenselbold; Harry Schiwiora, Ispringen; Manfred Stumke, Pforzheim, and Klaus Lutz, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,340
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027473
Int. Cl.³ C09D 5/38
U.S. Cl. 106—1.18 13 Claims

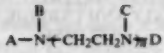
1. A gold-containing preparation suitable for coating metallic parts especially for coating fired on alloys in the dental art before the facing with ceramic compositions, said preparation consisting essentially of (1) gold powder having length and breadth dimensions of less than 50μ and a thickness of less than 2μ and a binder of an organic solvent and a resin, said binder being liquid at room temperature and able to be volatilized or burned at the firing temperature, there being present 60 to 95 weight % gold powder of which at least 50% are platelet shaped particles and 5 to 40 weight % of the binder or (2) a preparation consisting eseentially of (1) and an adhesive.

4,468,252
SET RETARDING ADDITIVES FOR CEMENT FROM AMINOMETHYLENEPHOSPHONIC ACID DERIVATIVES

Druce K. Crump, and David A. Wilson, both of Freeport, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 1, 1983, Ser. No. 500,104
Int. Cl.³ C04B 7/35
U.S. Cl. 106—90 20 Claims

1. In a process for retarding the setting of an aqueous cement slurry which comprises adding to said slurry an organic phosphonate, the improvement which comprises employing a compound of the formula



wherein the A, B, C and D substituents are independently selected from the group consisting of hydrogen, methylenephosphonic acid or salt thereof and 2-hydroxy-3(trialkylammonium halide)propyl wherein each alkyl group has from 1 to 5 carbon atoms, n is 0 to 15, and wherein said substituents include at least one methylenephosphonic acid group, or salt thereof, and at least one 2-hydroxy-3(trialkylammonium halide)propyl group.

4,468,253

METHOD AND APPARATUS FOR CONTINUOUSLY MANUFACTURING NON-SINTERED PELLET

Osamu Tajima, Kamakura; Seiji Matsui, Kawasaki; Hideyuki Yoshikoshi, Hino; Tsuneo Miyashita, Yokohama, and Michio Nakayama, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1983, Ser. No. 458,751

Claims priority, application Japan, Feb. 2, 1982, 57-14315

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—97 **4 Claims**

1. A method for continuously manufacturing a non-sintered pellet, which comprises:

adding a hydraulic binder and water to raw materials which comprise at least one of an iron ore fine, a non-ferrous ore fine and a dust mainly containing oxides of iron or non-ferrous metal, and mixing same; forming the resultant mixture to prepare a green pellet having a water content within the range of from 6 to 20 wt. %; continuously supplying said green pellet into a shaft type reactor which comprises a pre-treating zone, a hydration reaction zone following said pre-treating zone and a drying zone following said hydration reaction zone, to continuously pass said green pellet sequentially through said pre-treating zone, said hydration reaction zone and said drying zone; blowing a pre-treating gas at a prescribed temperature into said pre-treating zone to pre-treat said green pellet in said zone; blowing a gas for hydration reaction at a temperature within the range of from 50 to 100° C. containing saturated steam into said hydration reaction zone to hydrate said green pellet in said zone; and, blowing a drying gas at a temperature within the range of from 100° to 300° C. into said drying zone to dry said green pellet in said zone, thereby hardening said green pellet in said drying zone to continuously manufacturing a non-sintered pellet;

characterized by:

blowing said pre-treating gas with a relative humidity of up to 70% and at a temperature within the range of from 65° to 250° C. into said pre-treating zone to pre-dry said green pellet in said pre-treating zone until the difference in the water content in said green pellet before and after said pre-drying becomes at least 4 wt. % within the limits in which said green pellet in said pre-treating zone contains at least 2 wt. % water.

4,468,254

WAX EMULSION

Nobuo Yokoyama, Yokohama, and Yoshihiko Araki, Tokyo, both of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1983, Ser. No. 484,926

Claims priority, application Japan, Apr. 20, 1982, 57-65608

Int. Cl.³ C08L *91/06, 95/00, 91/08*

U.S. Cl. 106—271 **3 Claims**

1. A wax emulsion prepared from a composition comprising 100 parts by weight of a hydrocarbon wax melting in the range of 40°–120° C., and 5–25 parts by weight of at least one polymer of the group consisting of a liquid polybutadiene having a number-average molecular weight of 500–10,000, a polybutene having a number-average molecular weight of 300–3,000 and a polyisobutylene having a viscosity-average molecular weight of 20,000–50,000, said composition being emulsified in water, wherein said liquid polybutadiene is selected from the group consisting of low homopolymers of butadiene, copolymers of butadiene and one or more od conjugated diolefins of 4–5 carbon atoms, and low copolymers of butadiene and aliphatic or aromatic vinyl monomers having an ethylene unsaturation.

4,468,255

RHEOLOGY MODIFIERS FOR ARYLIDE YELLOW PIGMENT DISPERSIONS AND PIGMENT DISPERSIONS CONTAINING SAME

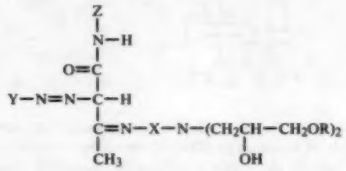
Russell J. Schwartz, Guttenberg, and Theodore Sulzberg, Highland Park, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Aug. 10, 1983, Ser. No. 521,686

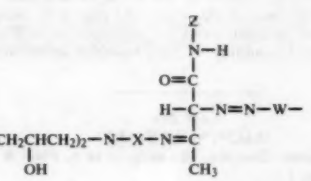
Int. Cl.³ C04B *31/40*

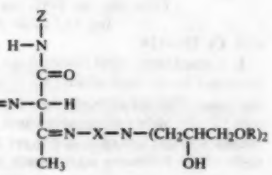
U.S. Cl. 106—288 Q **17 Claims**

1. A compound having the structural formula

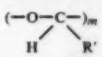


or the structural formula





wherein X represents a divalent aliphatic group having 4 to 54 carbon atoms; an aromatic group; or



wherein R′ represents hydrogen, alkyl, or aralkyl and m is an integer in the range of 4 to 40; W, Y, and Z each represents an aromatic group; and R represents an aliphatic or aromatic group having 4 to 30 carbon atoms.

12. A pigment dispersion having improved rheological properties that comprises 10 percent to 70 percent by weight of an arylide yellow or orange pigment, 20 percent to 85 percent by weight of an organic vehicle, and 1.5 percent to 15 percent by weight of rheology modifier that is a compound having one of the structural formulas set forth in claim 1.

4,468,256

PROCESS FOR THE HYDROLYSIS OF CELLULOSE FROM VEGETABLE RAW MATERIALS TO GLUCOSE AND APPARATUS FOR PERFORMING THE PROCESS

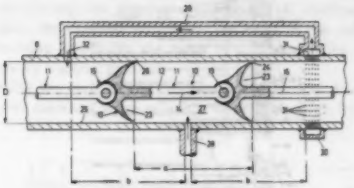
Klaus-Jürgen Hinger, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Dec. 15, 1981, Ser. No. 331,019

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048802

Int. Cl.³ C13K 1/06

U.S. Cl. 127—1 14 Claims



1. A process for preparing glucose by the hydrolysis of cellulose from vegetable raw materials, said raw material being in a finely comminuted form and impregnated with dilute acid, comprising providing a plurality of movable chambers, supplying the raw material to more than one of the chambers so that the raw material is supplied in small separate portions, providing an enclosed hydrolysis zone, supplying high pressure steam to the hydrolysis zone to heat the hydrolysis zone to a temperature of above 250° C., conveying the raw material in one of the chambers into and out of the hydrolysis zone so that said raw material is in contact with the high pressure steam in said hydrolysis zone for less than 2.5 seconds.

10. In an apparatus for preparing glucose by the hydrolysis of cellulose from vegetable raw materials, said raw material being finely comminuted from and impregnated with dilute acid, a tubular reactor comprising at least one straight pipe, an endless piston chain adapted to be conveyed through said pipe, said piston chain having a plurality of pistons spaced a predetermined distance apart, each piston of said chain forming a leakage gap opposite the inner wall of said pipe, two adjacent pistons defining a chamber a hydrolysis zone formed by said straight pipe, a high pressure steam line issuing approximately into the center of said pipe and into said hydrolysis zone, means to drive said piston chain at a predetermined speed wherein the spaced pistons are moved through the hydrolysis zone straight pipe such that the residence time of the material in the hydrolysis zone is less than 2.5 seconds.

4,468,257

WASHING AND REMOVAL METHOD OF HIGH MOLECULAR SUBSTANCES

Masahiro Kaneko; Tadashi Asanuma, both of Izumi; Nobutaka Uchikawa, Takaishi; Ichiro Fujio, Izumi, and Tetsunosuke Shiomura, Takaishi, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,764

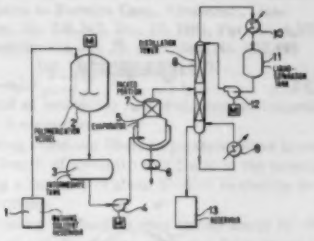
Claims priority, application Japan, Jun. 19, 1981, 56-93796; Jul. 9, 1981, 56-106271

Int. Cl.³ B08B 9/08; B01D 3/14

U.S. Cl. 134—22.13 2 Claims

1. Method for washing and removing high molecular substances stuck on the interior of a production apparatus upon producing an aromatic vinyl-acrylonitrile copolymer containing 5 to 33 weight percent acrylonitrile, comprising washing and removing said stuck high molecular substances from the interior of said production apparatus by using one or more solvents selected from the group consisting of an alkylamide and an alkylsulfoxide, which method comprises using, together with said one or more solvents, a mixture containing from 1.0×10^{-4} to 1.0 gram equivalent of at least one hydroxide having the formula:

$$M(OH)_n \qquad (I)$$



wherein n is an integer of 1 or 2, and M is an alkali metal when n is 1 or an alkaline earth metal when n is 2, per liter of said one or more solvents, and 0.03 to 3.0 weight percent of water based on the amount of one or more solvents.

4,468,258

METHOD OF CONTROLLING THE PARTIAL PRESSURE OF AT LEAST ONE SUBSTANCE MIXTURE OR MIXTURE OF SUBSTANCES

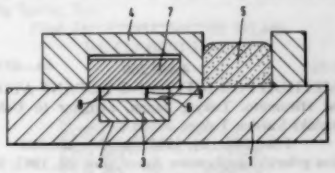
Werner Pfister, Blaustein-Arnegg, and Ewald Schlosser, Senden-Witzighausen, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 22, 1982, Ser. No. 400,678

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129449

Int. Cl.³ H01L 21/208

U.S. Cl. 148—1.5 9 Claims



9. A method of controlling the partial pressure of at least one substance or mixture of substances present in a substrate comprising arranging said substrate in a chamber, spacing apart therefrom at least one element containing said substance or mixture of substances in said chamber and selecting its crystal structure to provide the desired partial pressure in said chamber.

4,468,259

UNIFORM WAFER HEATING BY CONTROLLING LIGHT SOURCE AND CIRCUMFERENTIAL HEATING OF WAFER

Yoshiki Mimura, Kanagawa, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,492

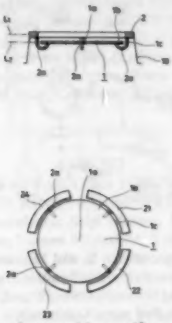
Claims priority, application Japan, Dec. 4, 1981, 56-194576; Jun. 30, 1982, 57-111500

Int. Cl.³ H01L 21/265, 21/324

U.S. Cl. 148—1.5 6 Claims

1. A method for heating a semiconductor wafer by means of application of light radiated from a light source, the method comprising the steps of irradiating semiconductor wafer with a

light radiated from the light source, including irradiating the circumferential portion of the semiconductor wafer, and additionally heating the circumferential portion of the semiconductor wafer with heat from a subsidiary heating means that extends along and adjacent to the circumference of the semicon-



ductor wafer to thereby provide a uniform temperature across the surface of the wafer, the subsidiary heating means heated by the light energy from the light source, the ratio of a thermal characteristic of the subsidiary heating means to that of the semiconductor limited to a range between 0.6 and 1.4 said characteristics being expressed by the following formula:

$$\frac{1-\eta}{\rho \cdot d \cdot C}$$

wherein

η: reflectivity;

ρ: specific gravity (g/cm^3);

d: thickness (cm); and

C: specific heat (joule/g·°C.).

4,468,260

METHOD FOR DIFFUSING DOPANT ATOMS

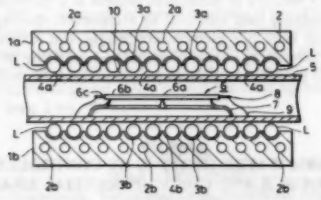
Tatsumi Hiramoto, Tokyo, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 480,082

Claims priority, application Japan, Jun. 22, 1982, 57-106189

Int. Cl.³ H01L *21/22, 21/265*

U.S. Cl. 148;1.5 **10 Claims**



1. A method for diffusing dopant atoms into a silicon wafer, which method comprises heating the entirety of said silicon wafer with said dopant atoms to a predetermined diffusing temperature in a short period of time by applying light thereonto under such conditions that the temperature difference between a central part of said silicon wafer and a peripheral part thereof is maintained within 65° C., thereby causing said dopant to undergo thermal diffusion into the interior of said silicon wafer.

4,468,261

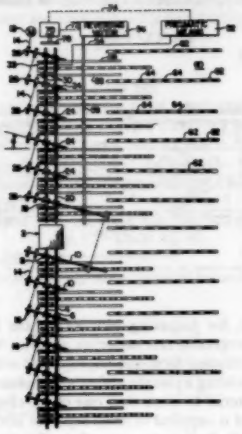
METHOD OF NORMALIZING SUCKER RODS USING A NORMALIZING UNLOADER

Robert T. Woodings, Box W, Mars, Pa. 16046

Filed Apr. 26, 1982, Ser. No. 371,582

Int. Cl.³ C21D *1/28*

U.S. Cl. 148—154 **5 Claims**



1. A method for receiving from an electric induction normalizing furnace sucker rods heated thereby to a normalizing temperature and delivering said rods to a cooling bed while said rods are substantially continuously supported and rotated about their longitudinal axes, said method comprising the steps of advancing a sucker rod endwise through an electric induction furnace, heating the sucker rod to a normalizing temperature by operating said furnace at 3000 to 10,000 hertz and with a power of about 400 to 800 kilowatts, rotating the heated sucker rod to prevent sagging while advancing the sucker rod lengthwise from said furnace along successively-arranged sheaves each rotated by one of a plurality of spaced, parallel and driven shafts which extend lengthwise at an angle of 75° to 80° with respect to the route of travel of said sucker rod as it is delivered from said furnace,

raising said rod by means of spaced support means which are located along said path of travel and are adapted for movement in unison in a direction transverse thereto,

advancing said rod from a first position above said path of travel to a second position above a cooling bed while causing said rod to continue to rotate about its longitudinal axis,

lowering said support means to deposit said sucker rod upon said cooling bed, and

returning said support means to a position beneath said path of travel.

4,468,262

METHOD OF COOLING HOT-ROLLED WIRE RODS

Hiroshi Kaneda; Hiroshi Sato; Katsunori Nashimoto, and Tadashi Matsui, all of Kamaishi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 186,010, Sep. 10, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 362,837

Int. Cl.³ C21D *9/52*

U.S. Cl. 148—156 **8 Claims**

1. A method for slow cooling a rod delivered from a hot rolling mill while transferring it, comprising:

coiling the rod into successive rings;

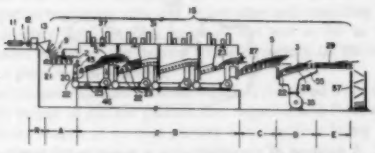
forming said rings into a packed coil having a plurality of overlapped rings with the centers of the rings offset and

the edges of the cross-section of the coil being very densely packed together;

conveying the thus packed coil through at least one enclosed spaced in the direction of transferring the coil, the enclosed space having a gaseous heat transfer medium therein;

cooling the thus conveyed coil at a rate not exceeding about 1° C./Sec. by maintaining the gaseous medium at a substantially uniform temperature lower than the temperature of the coil at the entrance to said enclosed space by circulating the gaseous medium in said enclosed space, and circulating the gaseous medium in said enclosed space over the exposed surfaces of the rings of the coil for removing heat from the rings by convection for progressively cooling the coil;

passing the rings of the coil through a vertical drop within said enclosed space which is sufficiently high for loosen-



ing the coil and making an opening between preceding rings and succeeding rings, and causing the succeeding rings to again come in contact with the preceding rings;

supplying a coolant to the location of the vertical drop and blowing the coolant from laterally of the vertical drop in the direction of conveying of the coil and against the portions of the rings loosened from the densely packed edges of the coil as the rings of the coil are falling through said vertical drop, said coolant being at a temperature lower than the temperature of the gaseous medium in said enclosed space and being in an amount sufficient for, together with the circulation of the gaseous medium, maintaining the gaseous medium at a substantially uniform temperature which is lower than the temperature of the coil at the inlet end of said enclosed space, whereby the temperature of the coil is progressively reduced in the direction of transfer of the coil.

4,468,263

SOLID PROPELLANT HYDROGEN GENERATOR

Glen D. Artz, Canoga Park, and Louis R. Grant, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1982, Ser. No. 450,849

Int. Cl.³ C06B *43/00*

U.S. Cl. 149—22 **5 Claims**

1. A solid reactant hydrogen gas generator composition comprising:

(i) a primary heat and hydrogen source selected from ammonia borane in an amount from about 50.00 weight percent to about 70.00 weight percent and hydrazine bisborane in an amount from 0 to about 30.00 weight percent;

(ii) a first hydrogen-containing compound that functions as an auxiliary heat and hydrogen source consisting of ammonium nitrate in an amount from about 10.20 weight percent to about 17.82 weight percent; and,

(iii) a second hydrogen-containing compound that functions as an auxiliary heat and hydrogen source consisting of $(NH_4)_2B_{10}H_{10}$ in an amount from about 9.80 weight percent to about 17.18 weight percent.

4,468,264

HIGH PRESSURE DECORATIVE LAMINATES CONTAINING AN AIR-LAID WEB OF FIBERS AND FILLER AND METHOD OF PRODUCING SAME

Theodore R. Clarke, and John F. Hosler, both of Cincinnati, Ohio, assignors to Formica Corp., Cincinnati, Ohio

Division of Ser. No. 226,345, Jan. 19, 1981, Pat. No. 4,379,194. This application Jul. 28, 1982, Ser. No. 402,493

Int. Cl.³ B32B *3/00, 5/02*

U.S. Cl. 156—62.2 **5 Claims**

1. A method of producing heat and pressure consolidated laminate which comprises,

(1) defibrating cellulosic fibers to produce fibers having an average length of about 0.5 to 2.5 mm in the presence of air having a humidity of about 50–80% to thereby form an air-fiber stream,

(2) incorporating into said air-fiber stream about 10–40% of particles of a thermosetting resin and from about 1% to about 20% of a pulverized, particulate filler having a particle size no larger than about 200 microns, to thereby form an air-fiber-filler-resin stream,

(3) depositing the fibers, resin and filler from said air-fiber-filler-resin stream onto a foraminous belt,

(4) pre-consolidating the deposited fibers, filler and resin to a thickness of from about 0.5–10 mm,

(5) forming a laminate assembly comprising, in superimposed relationship,

(A) a monostichous layer of said preconsolidated fibers, filler and resin and

(B) a thermosetting resin impregnated cellulosic print sheet and

(6) heat and pressure consolidating said laminate assembly.

4,468,265

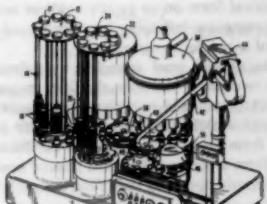
LIVE TOOL INSPECTION SYSTEM FOR SPINWELDING MACHINERY

Donald MacLaughlin, Midland, Mich., and Vincent E. Fortuna, Huntington Beach, Calif., assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed Jan. 6, 1982, Ser. No. 337,449

Int. Cl.³ B32B *31/22*

U.S. Cl. 156—64 **38 Claims**



16. A method for determining the quality of a spinwelded bond with a live tool inspection system:

(a) scanning a weld station tool of a spinwelder, having a plurality of weld stations equipped with means for producing a rotation signal when said tool is rotated;

(b) initiating power to said system at the arrival of a first weld station tool having a product thereon;

(c) receiving said rotation signal with a detector;

(d) comparing said rotation signal to a threshold value and generating an output when said rotation signal exceeds said present value;

(e) energizing an indicator means to a set condition upon

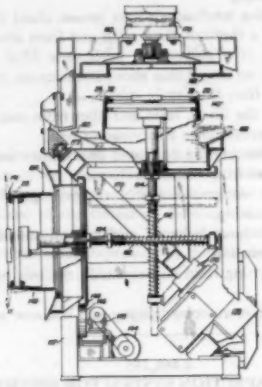
generation of said output whereby the location of a defective spinweld is identified.

4,468,266

BEAD AND FILLER ASSEMBLY MACHINE AND METHOD OF OPERATION THEREOF

Leon J. Cole; Edwin E. Mallory, both of Niles, Mich., and Hugh Bourassa, Cleveland, Ohio, assignors to National-Standard Company, Niles, Mich.

Continuation of Ser. No. 250,159, Apr. 2, 1981, Pat. No. 4,410,389. This application Mar. 16, 1983, Ser. No. 475,912
Int. Cl.³ B29H *17/34*
U.S. Cl. 156—131 8 Claims



1. The method of manufacturing fillered bead assemblies, including the steps of:

extruding continuously bead filler material,

accumulating the extruded filler material,

cutting the extruded filler material into predetermined lengths,

placing the bead and predetermined length of filler material in cylindrical form on an axially resilient mounted drum means having an inflatable bag positioned radially inwardly of said filler material, and

forming the fillered bead assembly by inflating said bag between two plates to rotate the filler materil about the bead, with one of said two plates being planar and positioned adjacent the bead to prevent the rotated filler material from being rotated beyond the centerline of the bead to form a planar cylindrical fillered bead assembly.

4. A continuously operating bead filler assembly in combination:

an extruder for extruding bead filler material,

an accumulator for accumulation of the extruded filler material,

a cutting, measuring and feeding means for selectively measuring, cutting and delivering the extruded and accumulated bead filler material, and

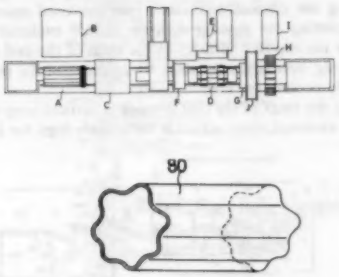
a multiple work station machine having at least one station for forming and rotating the cut and measured bead filler material onto the bead and at least one station for placing the bead and positioning the filler material in planar cylindrical form adjacent the bead, said at least one station including positioning of a bladder between two plates to thereby rotate said bead filler material onto the bead, with one of said two plates being planar and positioned adjacent the bead to prevent the rotated bead filler material from being rotated beyond the centerline of the bead to form a planar cylindrical bead filler assembly.

4,468,267

MANUFACTURING A RADIAL TIRE AND APPARATUS FOR PRACTICING SAID METHOD

Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jun. 10, 1982, Ser. No. 387,216
Claims priority, application Japan, Jun. 18, 1981, 56-94381
Int. Cl.³ B29H *17/20, 17/22*
U.S. Cl. 156—132 2 Claims



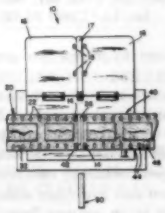
1. A method of manufacturing a green radial tire having a carcass ply and a pair of bead cores, comprising: forming the carcass ply into a cylindrical shape having an external diameter almost equal to an internal diameter of the bead cores; subsequently transforming the cylindrical carcass ply to assume a circumferentially wave-shaped corrugated carcass ply over an entire length thereof in the axial direction while containing an outer diameter of the carcass ply; arranging a pair of bead cores in selected positions on the wave-shaped corrugated carcass ply which has been contracted in diameter; then normalizing the carcass ply into its cylindrical shape so as to form a structure having the pair of bead cores in contact with the external surface of the carcass ply; expanding the carcass ply in diameter in an area thereof between the pair of bead cores of the structure; then bending end portions of the carcass ply disposed axially outside of the bead cores so as to enclose the bead cores therein within portions of the carcass ply; then assembling a cylindrical carcass layer by incorporating sidewall members with the structure; and transforming said cylindrical carcass layer into a torroidal shape thereby forming a green tire.

4,468,268

METHOD OF SPLICING MOTION PICTURE FILM NEGATIVES

Brian Ralph, 320 S. Beachwood Dr., Burbank, Calif. 91506

Filed Dec. 10, 1982, Ser. No. 448,423
Int. Cl.³ B31F *5/00*
U.S. Cl. 156—159 8 Claims



1. A method of splicing two lengths of motion picture film negative together comprising:

a. making a transverse cut which is approximately perpen-

dicular to the longitudinal axis of the motion picture film negative through the entire width of the first length of motion picture film negative and at a location between frames of pictures on the first length of motion picture film negative;

b. removing a portion of thickness of base material on the base side of the first length of motion picture film negative beginning adjacent its cut edge and extending for a distance into the film negative but not as far as the closest border of the nearest frame of picture on the motion picture film negative;

c. making a transverse cut which is approximately perpendicular to the longitudinal axis of the motion picture film negative through the entire width of the second length of motion picture film negative and at a location between frames of pictures on the second length of motion picture film negative;

d. removing a portion of thickness of the base material on the base side of the second length of motion picture film negative beginning adjacent its cut edge and extending for a distance into the film negative but not as far as the closest border of the nearest frame of picture on the motion picture film negative;

e. the thickness of base material which is removed from said first length of motion picture film negative and from said second length of motion picture film negative being approximately equal;

f. placing said first length of motion picture film negative and said second length of motion picture film negative adjacent each other such that their respective cut lengths abut one another;

g. applying an adhesive to the first length of motion picture film negative and to the second length of motion picture film negative at the location where base material was removed from each length of motion picture film negative;

h. placing a third length of film onto said first and second lengths of motion picture film negative at the location of the areas where material was removed; and

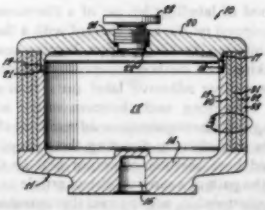
i. applying pressure to the adjoining areas of the two lengths of motion picture film negative and the third length of film until they are bonded together.

4,468,269

ULTRACENTRIFUGE ROTOR

Robert S. Carey, Menlo Park, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 28, 1973, Ser. No. 345,782
Int. Cl.³ B65N *81/00*
U.S. Cl. 156—175 **19 Claims**



1. An ultracentrifuge rotor comprising:

a body portion; and

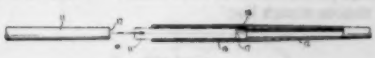
a plurality of nested rings of filament windings surrounding said body portion for strengthening and stiffening same.

4,468,270

METHOD AND APPARATUS FOR FABRICATING FISHING RODS

Milton J. Green, Quilcene, Wash., assignor to Woodstream Corporation, Lititz, Pa.

Filed Jul. 24, 1981, Ser. No. 286,682
Int. Cl.³ F16B *7/02*
U.S. Cl. 156—189 **6 Claims**



1. A method of fabricating a hollow tapered rod having a ferrule formed at one end thereof to receive a further rod in friction-fit engagement, said method employing a rod-like mandrel having a cross-section configuration which tapers throughout the mandrel length and a shoulder extending generally perpendicular to the mandrel length which demarks a sudden change in the mandrel cross-section taper and defines first and second longitudinally-extending mandrel sections which adjoin one another at said shoulder, said first mandrel section having a smaller cross-sectional configuration than said second mandrel section, said method comprising the steps of:

(a) wrapping at least one sheet of heat-curable material about said first mandrel section such that the peripheral contour of the material at said shoulder matches the peripheral contour of said second mandrel section at said shoulder to provide a smooth transition between the peripheries of the second mandrel section and the wrapped material at said shoulder;

(b) wrapping at least one additional sheet of heat-curable material about said second mandrel section and at least a portion of said first mandrel section, overlapping said shoulder;

(c) applying a generally radial compacting force to the material wrapped about the mandrel in steps (a) and (b);

(d) heat curing the wrapped material to cause it to solidfy in its wrapped and compacted configurations; and

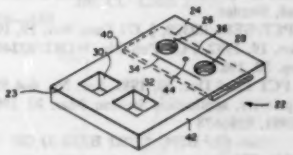
(e) removing the compacting force and the mandrel from the solidified wrapped material; whereby said ferrule is defined by the material wrapped about said second mandrel section.

4,468,271

METHOD OF MAKING A DEVICE FOR DETERMINING ANALYTE ACTIVITY

Charles W. Pierson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,221
Int. Cl.³ B32B *31/18, 31/20*; G01N *27/30*
U.S. Cl. 156—220 **3 Claims**



1. A method of making a device for determining the ionic analyte activity in a contacting sample of a liquid, said method comprising the steps of:

encapsulating a ribbon of porous material in a nonporous cover sheet to form a cover sheet element;

applying a pair of solid electrodes in a spaced-apart relationship to an electrically insulative frame member;

forming a pair of liquid access holes in said cover sheet

element through said porous material, said liquid access holes having a common centerline;

joining said cover sheet element to said frame member with said electrodes therebetween in an orientation such that each of said liquid access hole is aligned with a different electrode; and

after said encapsulating step, using an embossing tool to stretch said cover sheet directly over and generally along said porous ribbon to form at least one substantially continuous stretch line.

4,468,272

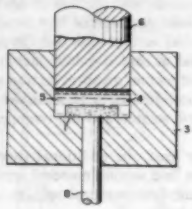
COMPOSITE MATERIAL MANUFACTURING METHOD EXOTHERMICALLY REDUCING METALLIC OXIDE IN BINDER BY ELEMENT IN MATRIX METAL

Tadashi Donomoto; Yoshiaki Tatematsu, and Atsuo Tanaka, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyato, Japan

Filed Aug. 24, 1983, Ser. No. 525,945

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—280 **14 Claims**



1. A method for making a composite material, in which:

first a quantity of reinforcing material is formed into a shaped mass bound together by an inorganic binder;

and then this shaped mass is compounded with a quantity of a molten matrix metal by a pressure casting method;

said molten matrix metal including a quantity of a certain element with a strong tendency to become oxidized;

and said inorganic binder including a metallic oxide which, when brought into contact at high temperature with said certain element, is reduced thereby in an exothermic reaction.

4,468,273

METHOD OF FLUID PRESSURE LAMINATING ASSEMBLED WOOD SEGMENTS TO FORM WOOD POLES

Tore Eklund, Ekshärad, and Torbjörn Schmidt, Sollentuna, both of Sweden, assignors to NYA Värmlands Limträ Aktiebolag, Ekshärad, Sweden

PCT No. PCT/SE81/00398, § 371 Date Nov. 19, 1982, § 102(e) Date Nov. 19, 1982, PCT Pub. No. WO82/03240, PCT Pub. Date Sep. 30, 1982

PCT Filed Dec. 30, 1981, Ser. No. 444,597

Claims priority, application Sweden, Mar. 20, 1981, 8101769; Nov. 11, 1981, 8106678

Int. Cl.³ B27G *11/00*; B32B *31/20*

U.S. Cl. 156—286 **8 Claims**

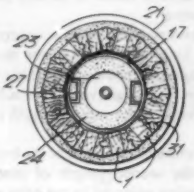
1. Method for manufacturing wood poles consisting of a number of sections glued together along abutting side faces so as to form a tubular pole with a central cavity, said method comprising:

providing a number of sections having a trapezoidal shape, each of said sections having side faces abuttable with side faces of other said sections;

providing said side faces with glue to give glue-bearing side faces, and bringing said glue-bearing side faces into intimate contact with each other to give a tub in which said sections define a central cavity;

placing sealing means at both ends of said tube for sealing said ends of said tube;

pumping air out of said central cavity through one or both of said sealing means to give a vacuum in said central cavity in comparison to the external pressure so that contact pressure between abutting side faces increases;



maintaining said vacuum until glued joints are formed to hold said sections together.

6. Method as claimed in claim 1, wherein said tubular pole is subjected to an external positive pressure as compared with surrounding pressure, whereby said contact pressure between abutting side faces is further increased.

7. Method as claimed in claim 1, wherein said tube is heated during gluing of said sections together by hot air in said central cavity and/or by hot air externally of the tube.

4,468,274

METHOD AND APPARATUS FOR BONDING THERMOSENSITIVE ADHESIVE LABEL

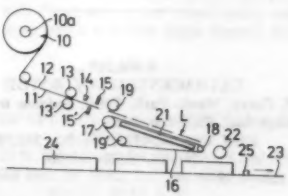
Takato Adachi, Asaka, Japan, assignor to E.D.M. Corporation, Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,417

Claims priority, application Japan, Jul. 31, 1981, 56-113932[U]; May 25, 1982, 57-076606[U]; May 25, 1982, 57-076607[U]; May 25, 1982, 57-088286

Int. Cl.³ B65C *9/08, 9/25*

U.S. Cl. 156—320 **15 Claims**



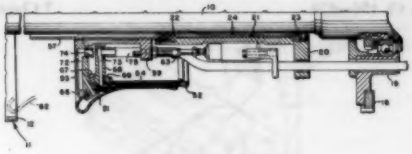
1. A method of labelling by use of a thermosensitive adhesive label equipped on the back thereof with a thermosensitive adhesive exhibiting tackiness upon heating and having no separate backing, said method comprising the steps of: placing said thermosensitive adhesive label on a heat-resistant conveyor belt; conveying said thermosensitive adhesive label while heating said thermosensitive adhesive so that said adhesive develops its tackiness; directing the path of said label by means of said heat-resistive conveyor belt so that said path approaches the path of a moving object article to be labelled in converging relationship; peeling said thermosensitive adhesive label from said heat-resistant conveyor belt by acutely bending said heat-resistant conveyor belt at a point proximate to a point of convergence of the path of said label with the path of said object article; and bonding said thermosensitive label to said object article whereby said object article is caused to be labelled.

4,468,275

TIRE BUILDING MACHINE

George E. Enders, Salem, Ohio, assignor to NRM Corporation, Akron, Ohio

Filed Jan. 17, 1983, Ser. No. 458,568
Int. Cl.³ B29H 17/22
U.S. Cl. 156—401 25 Claims



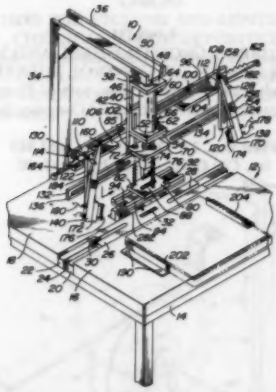
1. A tire building machine of the bead set, ply down and dual bladder type comprising a dual bladder assembly including an inner and outer bladder assembly adapted to be positioned inside and near the end of a tire building drum, means to support said inner and outer bladders for inflation on said assembly, and means to alter the configuration of the outer bladder and its support only to enable the machine to manufacture tires of different size.

4,468,276

BAG PAD BINDER

Hercules Membrino, 280 Paoli Pike, Malvern, Pa. 19355

Filed Mar. 11, 1983, Ser. No. 474,722
Int. Cl.³ B32B 31/18
U.S. Cl. 156—510 14 Claims



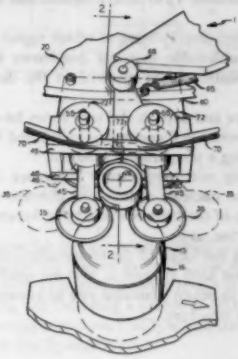
1. A bag pad binder comprising a table assembly which includes a support platform adapted to hold a stack of bag units in a predetermined position, support means connected to said table assembly and supporting a vertically-movable actuating means for vertical movement toward and away from said platform, and oppositely-disposed side sealing means operatively connected to said vertically-movable actuating means to move horizontally toward and away from each other while moving toward and away from a bag stack side sealing position in accordance with vertical movement of said vertically-movable actuating means.

4,468,277

FIXED JAW MEANS FOR HOLDING AND ROTATING CONTAINERS TRAVELING AROUND A TURRET PERIPHERY

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 5, 1983, Ser. No. 510,484
Int. Cl.³ B65C 9/04
U.S. Cl. 156—567 2 Claims



2. A method for holding and rotating containers around a turret periphery, the method comprising the steps of:

A. feeding containers, one by one, into a turret periphery, in generally vertical alignment;

B. holding the containers and rotating the containers by controlling each of the containers in a fixed jaw means including a pair of driven rotating rollers and a pair of idler rollers; and

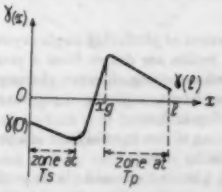
C. maintaining the alignment by nesting the container between the pair of rotating rollers and the pair of idler rollers as the containers travel around the turret periphery.

4,468,278

PROCESS FOR MONO-CRYSTAL GROWTH IN A CLOSED TUBULAR CHAMBER

Robert M. M. H. Cadoret, Chamalieres; Jean E. M. Omaly, Royat, and Marc A. Robert, Aurillac, all of France, assignors to Centre National d'Etudes Spatiales, France

PCT No. PCT/FR81/00033, § 371 Date Nov. 2, 1981, § 102(e) Date Nov. 2, 1981, PCT Pub. No. WO81/02590, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 10, 1981, Ser. No. 317,951
Claims priority, application France, Mar. 11, 1980, 80 05404
Int. Cl.³ C30B 23/06
U.S. Cl. 156—610 13 Claims



1. A process for the growth of at least one mono-crystalline structure, said process comprising the steps of:

(a) providing in a source zone of a chamber a source of the material which is to form the mono-crystalline structure,

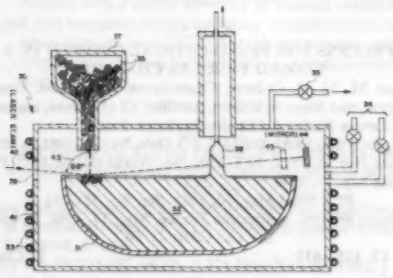
(b) said material source being vaporizable or sublimable, with or without disassociation, in the vapor state,
(c) hermetically closing the chamber and establishing a vacuum in the chamber,
(d) heating the source zone including the material source to a temperature T_s at which temperature the vaporization or sublimation of the material in the material source occurs,
(e) heating a portion of the chamber outside the source zone to a temperature T_p to form a deposit and sink zone in the chamber,
(f) said temperature T_p being at which vapor of the vaporizable or sublimable material condenses to deposit the mono-crystalline solid material in the deposit and sink zone,
(g) the source and deposit and sink zones having a temperature difference ΔT and being connected by a transition zone having a temperature gradient,
(h) regulating said temperature difference ΔT to a value effective to nucleate at least one discrete seed in the deposit zone of the chamber at a point located upstream of the sink zone, and
(i) modifying the value of the temperature difference ΔT as soon as said seed appears to prevent nucleation of other seeds and to obtain a suitable rate of growth of the mono-crystalline structure.

4,468,279

METHOD FOR LASER MELTING OF SILICON

Irving Itzkan, Boston, Mass., assignor to Aveo Everett Research Laboratory, Inc., Everett, Mass.

Filed Aug. 16, 1982, Ser. No. 408,393
Int. Cl.³ C30B *15/16*
U.S. Cl. 156—617 SP **8 Claims**



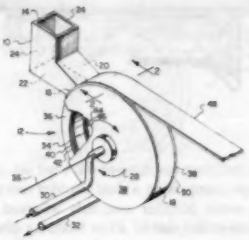
1. In the method of producing single crystal boules of silicon wherein said boules are drawn from a pool of liquid silicon disposed within a melting chamber, the steps comprising:
(a) supplying heat to said silicon pool to substantially maintain it in liquid form;
(b) introducing silicon in solid form at a predetermined point in said silicon pool;
(c) drawing a boule from said silicon pool at a point remote from the point at which said solid silicon is introduced; and
(d) introducing a laser beam into said melting chamber to impinge on the surface of said silicon pool at the point at which said solid silicon is introduced into said silicon pool to melt said solid silicon, said laser beam having an angle of incidence of about 88°.

4,468,280

SILICON RIBBON GROWTH WHEEL AND METHOD FOR SURFACE TEMPERATURE PROFILING THEREOF

David L. Bender, and Samuel N. Rea, both of Thousand Oaks, Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1982, Ser. No. 453,690
Int. Cl.³ C30B *19/02, 29/06, 35/00*
U.S. Cl. 156—624 **7 Claims**



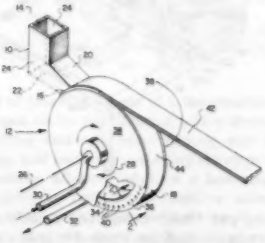
1. In apparatus for the production of semiconductor ribbon in which molten semiconductor material is brought into contact with the surface of a rotating metallic wheel which wheel is cooled by a cooling fluid in an interior cavity of said wheel, the improvement comprising:
said wheel having a thermal conductivity modifying means on its inner cooling fluid contacting surface for enhancing heat flow from the edges of the semiconductor contacting surface relative to the center thereof.

4,468,281

SILICON RIBBON GROWTH WHEEL AND METHOD FOR HEAT FLOW CONTROL THEREIN

David L. Bender, and Samuel N. Rea, both of Thousand Oaks, Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1982, Ser. No. 453,843
Int. Cl.³ C30B *19/02, 29/06, 35/00*
U.S. Cl. 156—624 **6 Claims**



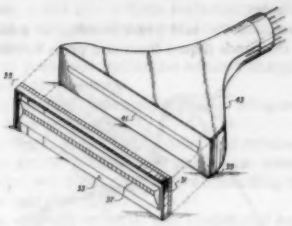
1. In apparatus for the production of semiconductor ribbon in which molten semiconductor material is brought into contact with the surface of a rotating metallic wheel, which wheel is cooled by a cooling fluid in an interior cavity of said wheel, the improvement comprising:
said wheel having a thermal resistance zone positioned between its outer semiconductor contacting surface and its inner cooling fluid contacting surface.

4,468,282

METHOD OF MAKING AN ELECTRON BEAM WINDOW

Armand P. Neukermans, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 22, 1982, Ser. No. 443,709
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—633 8 Claims



1. A method of making a vacuum window which is permeable to electrons generated by an electron beam in a CRT assembly comprising the steps of:

selecting a first material as a substrate;

depositing onto said substrate by chemical vapor deposition a film of a second material which is permeable to electrons at the electron beam energic of interest, said film having an internal stress of less than 2×10^9 dynes/cm^2;

removing a portion of said substrate to leave a continuous window of said film;

attaching said substrate to the faceplate of said CRT assembly, said faceplate having a hole therein which is aligned with said continuous window; and

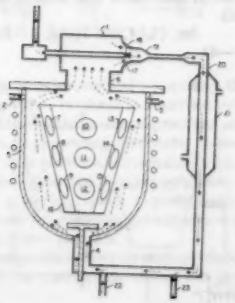
evacuating said CRT assembly to provide a pressure differential of substantially one atmosphere or higher across said continuous window.

4,468,283

METHOD FOR ETCHING AND CONTROLLED CHEMICAL VAPOR DEPOSITION

Irfan Ahmed, 31 Bradford Rd., Framingham, Mass. 01701

Filed Dec. 17, 1982, Ser. No. 451,450
Int. Cl.³ H01L 21/306, 7/36; B05D 5/12; C23C 11/00
U.S. Cl. 156—642 19 Claims



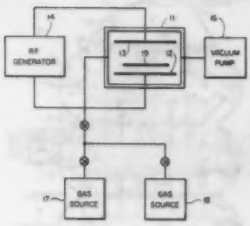
2. A method of removing a thin film from the surface of a substrate through a chemical reaction of film removing components contained in a gas contacted with the substrate surface in a reaction zone which comprises: forming a high velocity stream of gas comprising one or more film removing components by shooting said gas through a jetting means in the form of a high speed gas stream on the down stream side of said reaction zone.

4,468,284

PROCESS FOR ETCHING AN ALUMINUM-COPPER ALLOY

Norvell J. Nelson, Palo Alto, Calif., assignor to Psi Star, Inc., Hayward, Calif.

Filed Jul. 6, 1983, Ser. No. 511,542
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 3 Claims



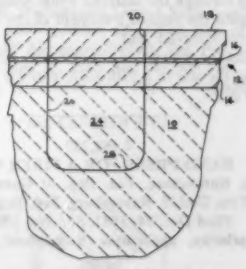
1. In a process for etching an aluminum-copper alloy containing up to about 6% copper by weight, the steps of: reacting the aluminum with a reactive chlorine specie in a gas plasma to produce Al_2Cl_6, and including a source of NO^+ in the plasma to oxidize the copper to form $CuCl_2$ which combines with the Al_2Cl_6 to form $CuCl_2.Al_2Cl_6$.

4,468,285

PLASMA ETCH PROCESS FOR SINGLE-CRYSTAL SILICON WITH IMPROVED SELECTIVITY TO SILICON DIOXIDE

Atiye Bayman, Palo Alto, and Mammen Thomas, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 22, 1983, Ser. No. 564,951
Int. Cl.³ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 16 Claims



6. A method of etching a semiconductor wafer masked with a masking layer having an opening therethrough exposing a portion of said wafer which is to be etched to form a depression of a desired depth, comprising:

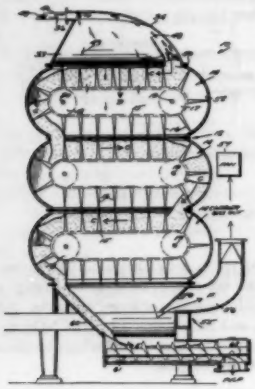
selectively plasma etching said portion of said wafer to a selected depth with a plasma comprising chlorine in an amount from about 40% to about 90%; a shape modifier species in an amount from about 10% to about 60%; and an etching selectivity enhancer in an amount sufficient to render the composition at least about ten times as effective for etching the wafer as for etching the masking layer, said percents being by mole, to a selected depth.

4,468,286

METHOD OF GAS TREATMENT OF FLUFFED PULP

Oystein Johnsen, Oslo, Norway, assigner to Myrens Verksted A/S, Oslo, Norway

Division of Ser. No. 356,465, Mar. 9, 1982, Pat. No. 4,426,256.
This application Oct. 13, 1983, Ser. No. 541,585
Int. Cl.³ D21C 9/10
U.S. Cl. 162—17 6 Claims



1. A method of continuously treating fluffed cellulosic fiber pulp material with a gas treatment containing ozone, comprising the steps of sequentially and continuously:

(a) entraining the material with the gas, and passing the gas-entrained material in a first path;

(b) substantially separating the material from the gas so that the material flows in a second path, wherein the second path is a serpentine path which comprises substantially horizontal portions interconnected by substantially gas-tight curved portions, and said third path is a substantially downward straight path which intersects with the horizontal portions of the second path, and the gas flows in a third path, distinct from the second path;

(c) moving the material in the second path so that it intersects the flow of the gas in the third path, with the gas passing through the material while remaining in the third path, until the desired treatment of the material with gas has been achieved; and

(d) moving the material in a fourth path after treatment, and moving the gas in a fifth path, entirely distinct from the fourth path.

4,468,287

BAND PRESS FOR A FIBER WEB

Hans Dahl, Ravensburg, Fed. Rep. of Germany, assignor to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,677
Claims priority, application Switzerland, Jan. 27, 1981, 499/81
Int. Cl.³ D21F 3/06, 3/08
U.S. Cl. 162—358 4 Claims

1. A band press for a fiber web, for instance a paper web comprising:

a cylinder;

means defining a press housing which extends along a portion of the circumference of the cylinder;

said press housing containing at least one pressure chamber for a pressurized fluid medium;

said cylinder and said press housing being arranged in coacting relationship with respect to one another such that there is formed therebetween a press zone;

at least one porous band for taking-up liquid expressed from the fiber web which is being processed;

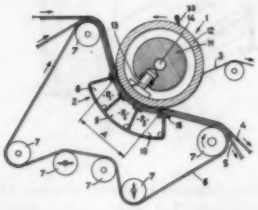
a press band which is impervious for the pressurized fluid medium in the pressure chamber;

the fiber web from which the liquid contained therein is to be removed together with said at least one porous band and said press band being guided through said press zone;

said cylinder possessing a solid closed surface;

said fiber web being guided through the press zone such that said fiber web bears against said solid closed surface of said cylinder;

means provided for said press housing at a side thereof where the bands depart from said press housing so as to



define an essentially sharp run-off edge by means of which the bands are separated from the fiber web immediately following the press zone at a location where there is a reduction in pressure and wherein immediately after said sharp run-off edge the fiber web continues to travel while in contact with the solid closed surface of the cylinder;

said run-off edge of said press housing being formed by two substantially planar surfaces which intersect one another at a predetermined angle which does not exceed 170°; and

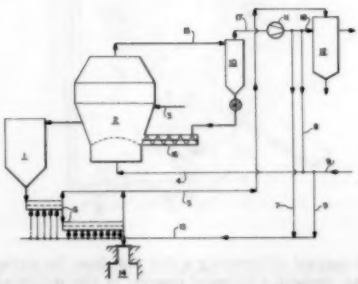
said run-off edge possesses a rounded portion having a radius of at most 10 mm.

4,468,288

METHOD OF PREHEATING COAL AND SUPPLYING PREHEATED COAL TO A COKE OVEN

Manfred Galow; Claus Flockenhaus, both of Essen; Joachim Meckel, Heiligenhaus; Horst G. Joseph, Essen, and Günter Gabriel, Datteln, all of Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,798
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110662
Int. Cl.³ C10B 31/08, 57/10
U.S. Cl. 201—41 4 Claims



1. A method of preheating coal and supplying the thus preheated coal to a coke oven, said method comprising:

supplying moist coal into a fluidized bed drier;

introducing a low oxygen content first heat carrier gas into said drier in direct contact with said moist coal and

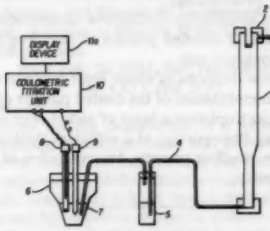
thereby fluidizing and drying said moist coal to form dried coal;
discharging said dried coal from said drier;
transferring said dried coal to a generally horizontal bulk material conveyor;
injecting a low oxygen contact second heat carrier gas through the bottom of said bulk material conveyor, and thereby transporting said coal generally horizontally and preheating said coal to form preheated coal;
discharging said preheated coal from said bulk material conveyor;
filling said preheated coal into a selected charging opening of a coke oven battery;
removing said first heat carrier gas, after being cooled in said drier, from said drier;
adding a first portion of said cooled and removed first heat carrier gas to said first heat carrier gas introduced into said drier, and thereby adjustably controlling the temperature of said drier; and
adding a second portion of said cooled and removed first heat carrier gas to said second heat carrier gas injected into said conveyor, and thereby adjustably controlling the temperature of said second heat carrier gas used to preheat said coal.

4,468,289

COULOMETRIC TITRATION METHOD

Kozo Muramatsu, Machida; Masanori Hirai, Kawasaki; Saburo Sugihara, and Hirozumi Nakamura, both of Chigasaki, all of Japan, assignors to Mitsubishi Kasai Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 231,013
Claims priority, application Japan, Feb. 12, 1980, 55-15736
Int. Cl.³ G01N *27/44*
U.S. Cl. 204—1 T **5 Claims**



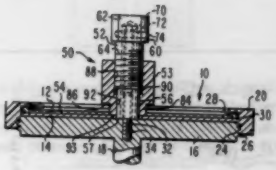
1. A coulometric titration method comprising the steps of:
balancing an electrolyte potential in a titration cell by detecting said potential while passing carrier gas and passing a current between generating electrodes immersed in the electrolyte so as to eliminate potential differences between the detected potential and a preset potential;
passing during a predetermined waiting time, a constant current between the generating electrodes not dependent upon the electrolyte potential;
introducing a composition to be titrated into the titration cell together with the carrier gas during the predetermined waiting time;
titrating by measuring the electrolyte potential and passing a current between the generating electrode so as to eliminate potential difference between the detected potential and the set potential;
integrating the difference between current flowing between the generating electrodes during the titration step and a blank current;
calculating the quantity of composition to be titrated introduced into the titration cell in accordance with an integrated value determined by said integrating step.

4,468,290

APPARATUS FOR ATTACHING A MATRIX TO AN ELECTROFORMING DEVICE AND METHOD THEREFOR

Charles A. Weaver, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,712
Int. Cl.³ C25D *1/10, 17/00, 17/06*
U.S. Cl. 204—5 **9 Claims**



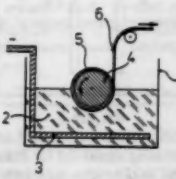
1. In an electroforming apparatus having a back plate and cathode arrangement to engage a record matrix for replication thereof, attaching means for positioning and holding the center portion of said record matrix in liquid-tight electrical contact with said cathode, wherein said center portion contains a center hole formed therethrough concentric to said matrix, said attaching means comprising:
(a) a threaded stud attachable to said cathode and arranged to project through said center hole of said record matrix;
(b) positioning pin means attachable to said threaded stud for positioning said center hole concentric to said threaded stud wherein said positioning pin means is arranged to pressingly and sealingly engage said cathode while not pressingly engaging said center portion of said record matrix; and
(c) a locking knob arranged in interacting relationship with said positioning pin means for effecting said holding of said center portion of said record matrix.

4,468,291

CONTINUOUS PRODUCTION OF POLYPYRROLE FILMS

Herbert Naarmann, Wattenheim; Gernot Köhler, and Johannes Schlag, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1983, Ser. No. 508,144
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 3226278
Int. Cl.³ C25B *3/02*
U.S. Cl. 204—13 **11 Claims**



1. A continuous process for the production of a polypyrrole film, comprising electrochemically polymerizing a pyrrole, or a mixture of a pyrrole with other comonomers, in an electrolyte solvent in the presence of a conductive salt, wherein the polymer is deposited in the form of a film on anodic material which has a sheet-like structure and is passed continuously through the electrolyte solution.

4,468,292

PRODUCTION OF HIGHLY RUST RESISTANT TINPLATE SHEETS FOR WELDED CANS

Tenji Ban; Kazuo Mochizuki, both of Chiba; Yasuhei Sakamoto, Togane, and Shunichi Harada, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Jun. 3, 1982, Ser. No. 384,665
Claims priority, application Japan, Jun. 10, 1981, 56-89385
Int. Cl.³ C25D 5/12, 5/50
U.S. Cl. 204—27 1 Claim

1. A process for manufacturing rust-resistant thinly coated tinplate suitable for making welded cans, comprising the steps of

electroplating a cold-rolled, degreased steel sheet with nickel to a build-up of 0.02 to 0.2 g/m^2,

annealing the nickel-plated sheet at a temperature of 550° to 720° C. to cause at least part of the nickel to diffuse into the underlying steel,

skin-pass rolling the sheet,

further electroplating the sheet with tin to a build-up of 0.05 to 1.5 g/m^2,

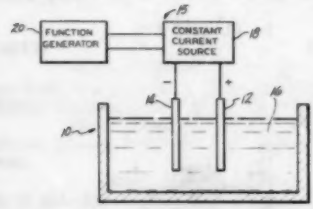
subjecting the tin-plated sheet to electrolytic chromate treatment with an electricity quantity of 0.3 to 10C/dm^2, and thereafter heating the sheet to cause the tin to reflow to form a high density iron-tin alloy layer at the steel-tin interface.

4,468,293

ELECTROCHEMICAL TREATMENT OF COPPER FOR IMPROVING ITS BOND STRENGTH

Ned W. Polan, Madison, and Chung-Yao Chao, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 355,053, Mar. 5, 1982, abandoned. This application Jan. 24, 1983, Ser. No. 460,630
Int. Cl.³ C25D 5/10, 11/00
U.S. Cl. 204—27 20 Claims



1. A process for treating metal foil for enhancing its ability to adhere to a substrate, said process comprising:

providing an electrolytic cell having an electrolytic bath solution containing a concentration of metal and an anode;

immersing said foil as a cathode in said solution;

providing a non-zero base cathodic current having a desired frequency and a desired waveform with recurring pulses, each said pulse comprising a first portion having a first current density for a first time period and a base portion having a second current density for a second time period, said first current density being greater than the limiting current density and substantially larger than said second current density, and said second current density being less than the limiting current density; and

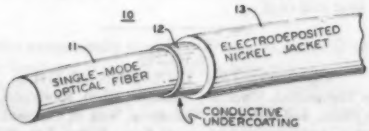
applying said current across said cell and subjecting said foil to a plurality of said current pulses having said first current density of each said pulse applied for less than about 0.1 seconds so that said metal from said solution is deposited onto said foil as a fine dendritic plating having improved peel strength, improved resistance to wear and stress, and improved powder transfer characteristics.

4,468,294

ACOUSTIC DESENSITIZATION OF OPTICAL FIBERS BY MEANS OF NICKEL JACKETS

G. Benjamin Hocker, Minnetonka, and John D. Skogen, Burnsville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 19, 1983, Ser. No. 496,143
Int. Cl.³ C25D 5/54
U.S. Cl. 204—27 7 Claims



1. A method for acoustic desensitization of selected portions of an acoustically sensitive optic fiber hydrophone by fabricating a nickel coated optic fiber comprising the steps of:

providing an extended length of acoustically responsive optic fiber hydrophone;

depositing an electrically conductive undercoating on and along at least a selected portion of said length of optic fiber hydrophone; and,

determining the thickness of nickel layer required to achieve acoustic desensitization of the coated portion of the optic fiber and electroplating a layer of nickel over said undercoated optic fiber portion of a sufficient thickness of said nickel layer to effect acoustic desensitization of said optic fiber portion.

4,468,295

PROCESS FOR ELECTROCHEMICALLY ROUGHENING ALUMINUM FOR PRINTING PLATE SUPPORTS

Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,567
Claims priority, application Fed. Rep. of Germany, May 10, 1982, 3217499
Int. Cl.³ C25D 5/44; C25F 3/04; G03C 1/94
U.S. Cl. 204—33 18 Claims

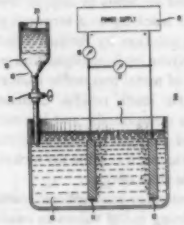
1. A process for electrochemically roughening aluminum or alloys thereof for use as printing plate supports, comprising the step of electrochemically roughening aluminum or an aluminum alloy in an aqueous electrolyte with an alternating current generated by superimposing at least two types of alternating current having different frequencies, wherein said frequency or frequencies of said higher-frequency superimposing alternating current(s) is/are from 3 to 100 times greater than said frequency of said superimposing alternating current having the lowest frequency and the ratio of the ampli-tudes of said higher-frequency superimposing alternating current(s) to said lowest-frequency superimposing alternating current ranges between about 0.1 and 10.

4,468,296

PROCESS FOR ELECTROPLATING PALLADIUM

Joseph A. Abys, Bridgewater, and Yutaka Okinaka, Madison, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 10, 1982, Ser. No. 448,514
Int. Cl.³ C25D 3/52
U.S. Cl. 204—47 20 Claims



1. A process for electroplating a metallic substance on a surface, said metallic substance comprising palladium comprising the step of passing current through a cathode, an electroplating bath, said electroplating bath comprising palladium complexed with at least one aliphatic polyamine with 3–20 carbon atoms, and an anode with cathode potential great enough to electroplate palladium, said electroplating bath having conductivity greater than 10^{-3} mho-cm and said electroplating bath comprising a source of palladium characterized in that at least part of the palladium in the electroplating bath is added as a palladium ammine hydroxide.

4,468,297

DEGRADATION AND DETOXIFICATION OF HALOGENATED OLEFINIC HYDROCARBONS

Donald T. Sawyer, and Thomas S. Calderwood, both of Riverside, Calif., assignors to Regents of the University of California, Berkeley, Calif.

Filed Feb. 25, 1983, Ser. No. 469,873
Int. Cl.³ C25B 3/02
U.S. Cl. 204—59 R 14 Claims

1. A process for the degradation of a hydrocarbon compound containing an olefinic bond and at least two halogen atoms selected from chlorine, bromine and iodine on the carbon atoms adjacent the olefinic bond, comprising reacting said hydrocarbon compound with a strong nucleophile selected superoxide and hydroxide in an aprotic solvent which is essentially free of water to form oxygenated hydrocarbon products and inorganic halogen ions.

4,468,298

DIFFUSION WELDED NONCONSUMABLE ELECTRODE ASSEMBLY AND USE THEREOF FOR ELECTROLYTIC PRODUCTION OF METALS AND SILICON

Stephen C. Byrne, Monroeville, and Asuri K. Vasudevan, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

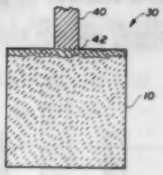
Filed Dec. 20, 1982, Ser. No. 451,070
Int. Cl.³ C25C 3/03, 3/06, 3/12, 3/34
U.S. Cl. 204—60 14 Claims

8. A process for producing an element selected from the group consisting of aluminum, lead, magnesium, zinc, zirconium, titanium and silicon by electrolytic reduction of a compound comprised of such element dissolved in a molten salt, said process including providing a nonconsumable anode assembly by the steps of:

providing a metal conductor for conveying electrical energy;

providing a ceramic electrode body having free metal or metal alloy in at least an outer surface portion thereof for making a connection between said metal conductor and said ceramic body; and

connecting said ceramic body to said metal conductor by



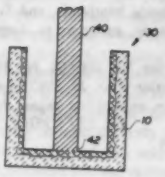
diffusion welding a portion of said metal conductor and the portion of said ceramic body having the free metal or metal alloy therein, and thereby forming a metal bond between said ceramic body and said metal conductor.

4,468,299

FRICTION WELDED NONCONSUMABLE ELECTRODE ASSEMBLY AND USE THEREOF FOR ELECTROLYTIC PRODUCTION OF METALS AND SILICON

Stephen C. Byrne, Monroeville; Siba P. Ray, Pittsburgh, both of Pa., and Robert A. Rapp, Columbus, Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 20, 1982, Ser. No. 451,071
Int. Cl.³ C25C 3/00, 3/04, 3/26, 3/12
U.S. Cl. 204—60 16 Claims



9. A process for producing an element selected from the group consisting of aluminum, lead, magnesium, zinc, zirconium, titanium and silicon by electrolytic reduction of a compound comprised of such element dissolved in a molten salt, said process including providing a nonconsumable anode assembly by the steps of:

providing a metal conductor for conveying electrical energy;

providing a ceramic electrode body having free metal or metal alloy in at least an outer surface portion thereof for making a connection between said metal conductor and said ceramic body; and

connecting said ceramic body to said metal conductor by friction welding a portion of said metal conductor to said portion of said ceramic body having the free metal or metal alloy therein.

4,468,300

NONCONSUMABLE ELECTRODE ASSEMBLY AND USE THEREOF FOR THE ELECTROLYTIC PRODUCTION OF METALS AND SILICON

Stephen C. Byrne, Monroeville, and Siba P. Ray, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

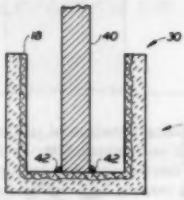
Filed Dec. 20, 1982, Ser. No. 451,072
Int. Cl.³ C25C 3/00, 3/04, 3/06, 3/12
U.S. Cl. 204—60 18 Claims

10. A process for producing an element selected from the group consisting of aluminum, lead, magnesium, zinc, zirco-

nium, titanium and silicon by electrolytic reduction of a compound comprised of such element dissolved in a molten salt, said process including providing a nonconsumable anode assembly by the steps of:

providing a metal conductor for conveying electrical energy;

providing a ceramic electrode body having free metal or



metal alloy in at least an outer surface portion thereof for making a connection between said metal conductor and said ceramic body; and

connecting said ceramic body to said metal conductor by providing a metal bond between a portion of said metal conductor and the free metal or metal alloy in the portion of said ceramic body having the free metal or metal alloy therein.

4,468,301

ION EXCHANGE MEMBRANE CELL AND ELECTROLYTIC PROCESS USING THEREOF

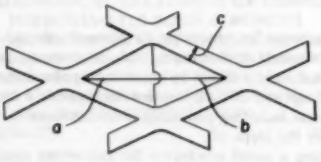
Yoshio Oda; Takeshi Morimoto, and Toshiya Matsubara, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 288,684, Jul. 31, 1981, abandoned. This application Mar. 29, 1983, Ser. No. 479,902

Claims priority, application Japan, Jul. 31, 1980, 55-104284

Int. Cl.³ C25B *1/34*

U.S. Cl. 204—98 **16 Claims**



1. An electrolytic cell, which comprises:

an anode and a cathode which are partitioned by an ion exchange membrane having at least one surface roughened, said surface roughening being defined by a fine concavo-convex structure wherein the average depth (heighth) of said structure ranges from 0.01 to 30μ with the average number of surface roughening concavo-convex structures ranging from 1 to 10^{13} per mm^2, and wherein said electrodes are spaced apart in non-contacting relationship from said membrane surfaces up to a distance of no more than 2 mm.

4,468,302

PROCESSING COPPER-NICKEL MATTE

Peter D. Parker, Brooklyn, N.Y., and Eric L. Fruch, New Brunswick, N.J., assignors to Amax Inc., Greenwich, Conn.

Filed Aug. 26, 1982, Ser. No. 411,934

Int. Cl.³ C25C *1/12*

U.S. Cl. 204—108 **10 Claims**

1. A process for refining a sulfur-containing, copper-containing concentrate, which also contains at least one metal less noble than copper, at least about 10 wt. % of which is in an acid-soluble form, and the (nickel plus cobalt) content of which is at least about 80 wt. %, comprising

(a) providing a slurry of said concentrate in particulate form in a copper-containing sulfuric acid leaching solution,

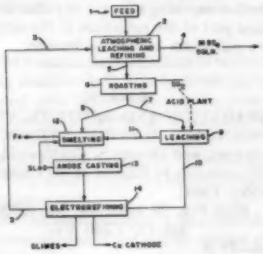
(b) subjecting said slurry to a first stage leaching and refining step at atmospheric pressure and a temperature ranging from about 40° to about 95° C. to effect the simultaneous dissolution of metal less noble than copper and cementation of substantial amounts of copper from said solution,

(c) continuing said leaching to a terminal pH of over about 4 to refine said solution by further rejecting copper and impurities therefrom by hydrolysis and provide a purified sulfate solution of metal less noble than copper and a first stage atmospheric leach residue containing undissolved metal and sulfur compounds, and impurities,

(d) separating said purified sulfate solution from said first stage atmospheric leach residue for nickel recovery of said metal less moble than cooper,

(e) roasting the first stage atmospheric leach residue to form a calcine containing metal values in oxidic form and containing less than about 1 wt. % surfur,

(f) leaching at least a portion of the calcine with sulfuric acid to produce a second leach residue and a copper sulfate solution containing an amount of copper at least equal to the sum of the amount of copper in the solution with-



drawn in step (k) plus an amount electrochemically equivalent to the total amount of metal less noble than cooper contained in the anode fromed in step (m),

(g) separating the copper sulfate solution formed in step (f) from the second leach residue,

(h) mixing together the second leach residue with any unleached portion of the calcine,

(i) smelting the mixture formed in step (h) to form a metallic alloy of copper and metal less noble than copper which comprises at least about 20 wt. % copper,

(j) casting the alloy formed in step (i) into an anode,

(k) establishing an electrolytic cell comprising the copper sulfate solution formed in step (g) having immersed therein the anode formed in step (j) and a cathrode,

(l) applying between the anode and the cathode in said electrolytic cell a votage effective to dissolve to anode and to preferentially deposit copper onto the cathode, whereby the copper sulfate solution becomes enriched in metal less noble than copper and depleted of copper,

(m) withdrawing said copper-depleted solution from the electrolytic cell whicle said solution contains sufficient copper that the cathodic copper deposit formed in step (l) comprises at least about 99% copper, and

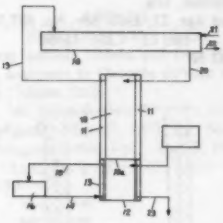
(n) recycling said withdrawn copper-depleted solution to step (a).

4,468,303

METAL RECOVERY

Arnold F. Griffin, Scarborough, and Michael C. Costello, Greenwood, both of Australia, assignors to Norcim Investments Pty Ltd., Osborne Park, Australia

Filed Dec. 1, 1982, Ser. No. 445,847
Int. Cl.³ C25C 1/20
U.S. Cl. 204—109 14 Claims



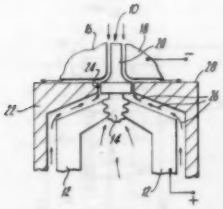
1. A gold recovery process in which a particulate material containing water and having adsorbed thereon a solubilised gold compound is located in packed form in a fractionating column, a liquid containing a major proportion of water miscible organic liquid is placed in an evaporator and boiled such that it enters the packed fractionating column as a vapour, said water miscible organic liquid being more volatile then water and being preferentially retained in the column, and the water content of the particulate material draining into the evaporator in admixture with organic liquid and carrying with it the dissolved gold.

4,468,304

ELECTRO CHEMICAL MACHINING METHODS

Christopher P. R. Hill, Olveston, Nr. Pilning, England, assignor to Rolls-Royce Limited, London, England

Filed Jan. 24, 1984, Ser. No. 573,313
Claims priority, application United Kingdom, Feb. 10, 1983, 8303656
Int. Cl.³ B23P 1/00
U.S. Cl. 204—129.6 8 Claims



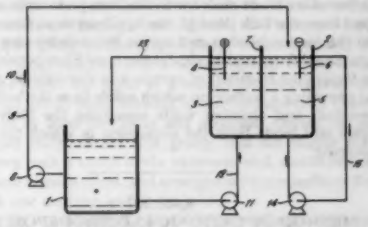
1. A method of electrochemically machining a workpiece including the steps of locating the workpiece in a fixture, enclosing the fixture and/or that part of the workpiece which is not required to be machined in a cowl such that a peripheral space is provided therebetween, and delivering a flow of water the maximum conductivity of which is about 300 micro mhos, to the peripheral space via the interior of the cowl, at a pressure sufficient to prevent ingress of electrolyte.

4,468,305

METHOD FOR THE ELECTROLYTIC REGENERATION OF ETCHANTS FOR METALS

Maurice R. Hillis, Chester, England, assignor to The Electricity Council, London, England

Filed May 2, 1980, Ser. No. 145,948
Claims priority, application United Kingdom, May 8, 1979, 7915899
Int. Cl.³ C25F 5/00, 7/02
U.S. Cl. 204—130 13 Claims



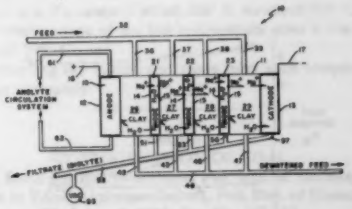
1. A method of regenerating a spent metal etchant solution and the metal which has been etched therewith, utilising an electrolytic cell provided with a cell divider to define an anode compartment and a cathode compartment, which method comprises circulating the spent etchant solution between an etching vessel and the said anode compartment, the spent etchant thus constituting the cell anolyte, the cathode compartment containing a catholyte solution comprising ions of the etched metal and no more than an insignificant amount of unreduced etchant and electrolytically re-oxidising in the cell reduced etchant present in the anolyte solution to regenerate the etchant in the anode compartment, the said metal being electrolytically regenerated in the cathode compartment, the concentration of ions of the etched metal in the catholyte being maintained by continuously or intermittently introducing into it an appropriate small quantity of the solution circulating between the anode compartment and the etching tank, the said quantity being such that the concentration of un-reduced etchant in the catholyte is not sufficiently high as to prevent the electrolytic reduction of ions of the etched metal.

4,468,306

BIODIC ELECTROFILTRATION

Mark P. Freeman, Darien, and Peter R. Klinkowski, Norwalk, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 6, 1983, Ser. No. 482,488
Int. Cl.³ B01D 57/02, 13/02
U.S. Cl. 204—180 P 12 Claims



1. An electrically augmented vacuum filtration apparatus comprising a tank for holding a bath of solids in suspension, said tank having inlet and outlet means, a pair of spaced electrode structures immersed in said suspension and connected to an external electric circuit for establishing an electrical poten-

tial between said electrode structures, at least one biode immersed in said suspension intermediate said electrode structures, said biode comprising a chamber having one wall thereof composed of an ion-pervious member facing one of said electrode structures, a second wall of said biode composed of a liquid-pervious filter medium facing the other of said electrode structures, the ion-pervious member and the filter medium forming the chamber walls of the biode being characterized by a polarity opposite to that of the electrode structure they are facing when an electrical potential is imposed by the electrode structures, said biode having no direct connection to the external electric circuit, vacuum means communicating with the interior of the biode chamber to facilitate permeation of carrier liquid from the bath through the liquid-pervious filter medium into the biode chamber and means for withdrawing such biolyte liquid from said biode chamber, said ion-pervious member facilitating transport of certain ions through the apparatus and providing a surface on which solids from the bath may be deposited, said chamber walls separating the biolyte liquid within said biode from the suspension in which the biode is immersed.

4,468,307

METHOD OF CATIONIC ELECTRODEPOSITION

Marco Wismer, Gibsonia, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 301,712, Sep. 14, 1981, Pat. No. 4,419,467.
This application Jun. 6, 1983, Ser. No. 501,344
Int. Cl.³ C25D *13/06*
U.S. Cl. 204—181 C **7 Claims**

1. In a method of coating a conductive substrate serving as a cathode in an electrical circuit comprising said cathode and an anode immersed in an aqueous electrodepositable coating composition, said method comprising passing electric current between said cathode and said anode to cause a coating to deposit on said cathode, said coating composition comprising a resin which contains cationic base groups and which is formed from reacting a polyepoxide resin with a cationic base group former, the improvement comprising a polyepoxide resin which is formed from reacting a polyepoxide with a polyether polyol; said polyether polyol formed from reacting:

(A) a cyclic polyol with

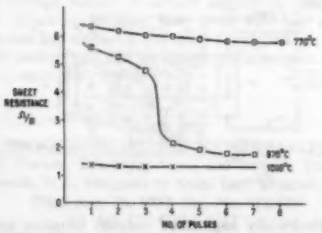
(B) ethylene oxide or a mixture of ethylene oxide and an alkylene oxide having 3 to 8 carbon atoms in the alkylene chain; the equivalent ratio of (B) to (A) being within the range of 3 to 20:1.

4,468,308

METALLIC SILICIDE PRODUCTION

Peter D. Scovell, Chelmsford; Paul J. Rosser, and Gary J. Tomkins, both of Harlow, all of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 3, 1983, Ser. No. 463,375
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **10 Claims**



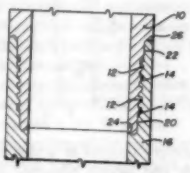
1. A method of forming a metallic silicide layer on a substrate, including the steps of depositing the metal and silicon on the substrate, and subsequently pulse heating the substrate, in an inert atmosphere, to a temperature and in a time sufficient to cause interdiffusion of the metal and silicon to form a homogenous layer and reaction of the constituents thereof to form the metallic silicide.

4,468,309

METHOD FOR RESISTING GALLING

Gerald W. White, Dallas, Tex., assignor to White Engineering Corporation, Dallas, Tex.

Filed Apr. 22, 1983, Ser. No. 487,749
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 N **30 Claims**



1. A method for resisting galling of coacting threaded members comprising:

depositing a material film by high energy level ion plating onto the machined profile of at least one member for providing a thin mechanically insulating film on the coacting metal-to-metal surfaces having a low shear stress value thereby separating the coacting metal-to-metal surfaces from each other for preventing galling; and

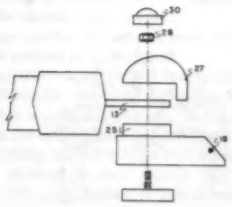
rotating at least one of the threaded members during deposition of the film to provide a uniform film.

4,468,310

ALUMINUM MARINE ANODE WITH CORE ACTIVATOR

Rolland C. Sabins, Lakeside, Calif., assignor to Sabins Industries, Inc., San Luis Rey, Calif.

Division of Ser. No. 707,675, Jul. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 512,108, Oct. 4, 1974, abandoned. This application Jul. 28, 1983, Ser. No. 517,989
The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—197 **8 Claims**



1. Structure within an array of marine anodes connected cathodically to protect a ferrous surface exposed to brine comprising:

a metallic base physically coupled to said ferrous surface including spaced, upstanding sides and a top;

a tee bolt between said upstanding sides with a threaded shank extending up through said top;

a non-ferrous metallic mounting pad physically coupled to said top and surrounding said threaded shank, constituting

means for direct coupling to a mounting lug of a marine anode;

top washer means cooperatively adapted with said mounting pad to clamp said mounting lug therebetween; and

a nut for said threaded shank constituting means for pressing said top washer down towards said mounting pad and pressing said tee bolt into firm engagement with said top.

4,468,311
ELECTROLYSIS CELL

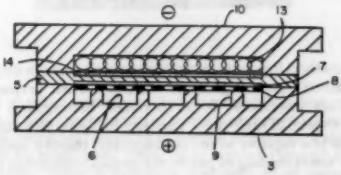
Oronzio de Nora; Antonio Nidola, and Gian N. Martelli, all of Milan, Italy, assignors to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 102,629, Dec. 11, 1979, Pat. No. 4,343,690. This application May 27, 1982, Ser. No. 382,691

Claims priority, application Italy, Aug. 3, 1979, 24919 A/79

Int. Cl.³ C25B *9/00, 11/03, 11/12, 15/08*

U.S. Cl. 204—252 **1 Claim**



1. An electrolysis cell comprising a flexible, ion-permeable diaphragm having opposed gas and liquid permeable electrodes in contact with opposite sides of the diaphragm, at least one of the said electrodes comprising (a) an electroconductive, resilently compressible, electrolyte permeable nickel mat open to gas and electrolyte flow and (b) graphite paper between the said mat and the diaphragm and means to compress the mat and graphite paper against the diaphragm.

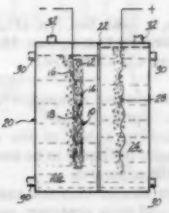
4,468,312
RETICULATE ELECTRODE FOR ELECTROLYTIC CELLS

Igor V. Kadija, and David D. Justice, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 238,267, Feb. 25, 1981, Pat. No. 4,401,519. This application May 2, 1983, Ser. No. 490,812

Int. Cl.³ C25B *11/03*

U.S. Cl. 204—284 **9 Claims**



1. A reticulate electrode for use in the electrolysis of aqueous salt solutions in which a gaseous product is produced which comprises a network of electroconductive metal coated filaments having a porosity of above about 80 percent, said reticulate electrode having a face and a back side, said back side having a non-continuous coating of a hydrophobic coating agent.

4,468,313
SPUTTERING TARGET

Katsuya Okumura, Yokohama, and Masaaki Ueda, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 3, 1983, Ser. No. 519,906

Claims priority, application Japan, Mar. 3, 1981, 56-30209

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **7 Claims**

1. A sputtering target comprising:

a backing plate;

a mosaic layer laid on the backing plate, shaped substantially as a circle and having a central hole, said layer consisting of a first group of fan-shaped plates which are made of a first target material and a second group of fan-shaped plates which are made of a second target material, said second group being divided into subgroups each consisting of at least one plate and arranged among the fan-shaped plates of the first group, said fan-shaped plates having each a notch in the narrower end, connected side by side to each other, and arranged with top surfaces flush with one another; and

a keep jig contacting the inner peripheral edge and outer peripheral edge of the mosaic layer, thereby attaching the mosaic layer to the backing plate.

4,468,314
HYDROPYROLYSIS OF CARBONACEOUS MATERIAL

Richard P. Rhodes, Westfield, and Kenneth D. Rose, Somerset, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 1, 1982, Ser. No. 413,832

Int. Cl.³ C10G *1/00;* **C10B** *49/04, 49/10*

U.S. Cl. 208—8 R **6 Claims**

1. A process for converting solid carbonaceous material selected from the group consisting of coal, oil-shale, lignite, peat and heavy oil, to a discriminate range of liquid and gaseous products, which process comprises:

(a) feeding the carbonaceous material into a plug flow type reactor containing two or more temperature zones with each temperature zone containing one or more stages, and wherein the temperature of the carbonaceous material within each temperature zone is substantially constant;

(b) introducing a hydrogen-containing gas independently into each one or more stages of each temperature zone in such a manner that the gas residence time in each stage is less than about 30 seconds and the total solids residence time is from about 5 to 150 minutes, wherein the temperature of the hydrogen-containing gas introduced into each successive temperature zone is at a temperature which will cause each successive temperature zone to be at least 25° C. higher than the preceding temperature zone and wherein the temperature of the gas introduced into the first temperature zone is such that the temperature in that zone is in the range of about 350° C. to about 450° C. and the temperature of the last temperature zone is less than about 700° C.; and

(c) collecting the liquids and gases from each temperature zone separately.

4,468,315
HYDROGENATION OF COAL

Helmut Romberg, Bad Duerkheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 7, 1982, Ser. No. 337,682

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1981, 3101598

Int. Cl.³ C10G *1/06*

U.S. Cl. 208—10 **5 Claims**

1. A process for hydrogenating coal in a slurry of coal and oil which comprises:

contacting the slurry of coal and oil with hydrogen and a hydrogenation catalyst in a reactor;

passing the hot vapors from the reactor to a first mixing zone wherein the vapors are mixed with a preheated coal and oil slurry and wherein the vapors heat the slurry to a temperature of at least 350° C. while the vapors are correspondingly cooled;

separating the vapors from the slurry;

pumping the heated slurry to the reactor; cooling the vapors and separating reaction product from product free gases; and

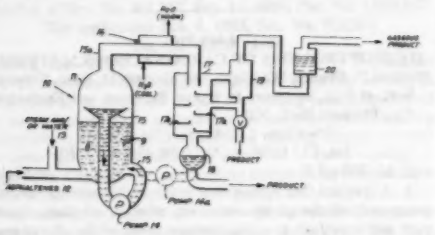
thereafter mixing the product-free gases, which include hydrogen, with the coal and oil slurry in a second mixing zone, said product-free gases being used as a thermal medium to preheat said slurry.

4,468,316

HYDROGENATION OF ASPHALTENES AND THE LIKE

Rollan Swanson, Beatty, Nev., assignor to Chemroll Enterprises, Inc., New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,687
Int. Cl.³ C10G *47/06*
U.S. Cl. 208—59 **16 Claims**



1. In a process for converting carbonaceous materials to products of lower viscosity and/or end products that are more hydrogenated, said converting being the presence of alkali metal sulfide catalysts and without adding hydrogen gas serving substantially as a hydrogenation reactant, the improvement comprising:

(a) reacting, at a temperature of up to about 600° C. in the presence of added stream, added in an amount of up to 130%, based on the end products being withdrawn, an oil, or resin or asphaltene fraction of a distillate having a boiling point of at least 850° F.+, or mixtures thereof, with a supported or unsupported catalyst composition comprising:

(1) a first solution of an alkali metal hydroxide dissolved in methanol, ethanol, 1-propanol or 1-butanol or mixtures of these alkanols, or

(2) a second solution of said alkali metal hydroxide-alkanol as defined in (1) above to which water dissolved alkali metal hydroxide has been added and wherein the ratio of said first solution to said alkali metal hydroxide, on a mole bases, in said solutions is from 0.5:1 to 1:0.5,

said first or second solution being treated with hydrogen sulfide, such that in either solution

(i) a single phase solution forms, or

(ii) a two phase solution forms,

said catalyst composition being said single phase solution of (i), said two phase solution of (ii), each of the phases of (ii), taken individually, mixtures of the phases of (ii) with each other, a mixture of each of the individual phases of (ii) with the single phase solution of (i), or a mixture of the two phases of (ii) with each other taken with the single phase of (i), and removing the residual solvent from the foregoing and

(b) recovering reaction products from step (a), including gases produced in the reaction.

4,468,317

SELECTIVE RHEOLOGICAL SEPARATION OF CLAYS

Ralph E. Turner, Jr., Tennille, Ga., assignor to Anglo-American Clays Corporation, Sandersville, Ga.

Continuation-in-part of Ser. No. 216,652, Dec. 15, 1980, Pat. No. 4,334,985. This application Apr. 26, 1982, Ser. No. 372,188
The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.
Int. Cl.³ B03B *1/00*
U.S. Cl. 209—5 **13 Claims**

1. A method for continuously processing a kaolin clay which has relatively poor high-shear viscosity when prepared as a high-solids suspension, so as to obtain therefrom a fraction having a value of high-shear viscosity in high-solids suspension which is low relative to the starting clay, thereby being desirable for use in coating of paper; the method comprises the steps of:

forming the kaolin clay into a dilute aqueous suspension having from 10% to 20% solids by weight and forming said suspension into a continuous flow stream; mixing the stream of flowing suspension at a given point with from about 0.001% to 0.1% by weight of dry clay, of a high molecular weight anionic polyacrylamide polymer or derivative thereof, to selectively flocculate aggregates of minute kaolin platelets; and

continuously separating the flowing treated suspension downstream of the mixing point, into a sedimented phase containing a clay fraction of relatively high high-shear viscosity characteristics, and a supernatant phase which is substantially free of aggregates and which contains in suspension as product, a fraction of the clay possessing relatively low high-shear viscosity properties.

4,468,318

APPARATUS FOR THE UNINTERRUPTED TREATMENT OF A LIQUID WITH ION EXCHANGE RESINS

Guy Le Dall, Maurepas, France, assignor to Permo S.A., Rueil Malmaison, France

Filed Jan. 4, 1983, Ser. No. 455,534
Claims priority, application France, Jan. 15, 1982, 82 00576
Int. Cl.³ C02F *1/42*
U.S. Cl. 210—96.1 **5 Claims**

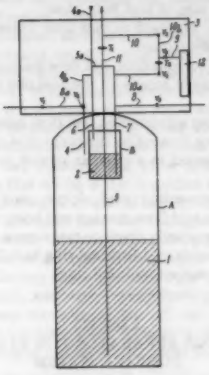
1. An apparatus for treating a liquid with ion exchange resins, said apparatus comprising:

a main container having a bed of ion exchange resins through which passes the liquid to be treated during normal operation of the apparatus;

an auxiliary container smaller than said main container and positioned within said main container, said auxiliary container having a bed of ion exchange resins through which passes the liquid to be treated during regeneration of said ion exchange resins in said main container, said bed of ion exchange resins in said auxiliary container having a volume smaller than that of said bed of ion exchange resins in said main container; and

means performing automatically a cycle of regeneration of said ion exchange resins of the apparatus by first regenerating said ion exchange resins in said auxiliary container

while passing the liquid to be treated through said ion exchange resins in said main container, immediately upon completion of said regeneration of said ion exchange resins in said auxiliary container regenerating said ion exchange resins in said main container while passing the liquid to be treated through said ion exchange resins in



said auxiliary container, and immediately upon completion of said regeneration of said ion exchange resins in said main container returning to normal operation of the apparatus by passing the liquid to be treated through said ion exchange resins in said main container while maintaining said auxiliary container inactive.

4,468,319

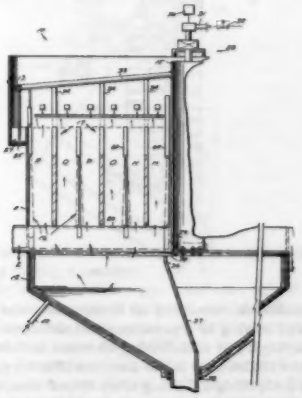
STATIONARY DIFFUSER

Oliver A. Laakso, Haralyn (West), #2 Middle Rd., Smiths Parish, Bermuda 3-18

Filed May 4, 1982, Ser. No. 374,763

Int. Cl.³ B01D *29/38, 25/32*

U.S. Cl. 210—97 **31 Claims**



20. Apparatus for treating a suspension comprising: an upright cylindrical vessel a central shaft mounted for rotation within said cylindrical vessel about the axis of said cylindrical vessel; a plurality of annular stationary screens disposed within said vessel and spaced from each other and from said central shaft; a plurality of radially extending extraction arms physically and hydraulically connected to said stationary annular screens, said extraction arms partitioning said vessel into a plurality of radial segments of substantially the same cross-sectional area, and said screens partitioning each radial segment into a plurality of vertically extending channels; wherein each of said stationary screen structures comprises at least one screen surface and an interior supporting structure extending substantially parallel to the axis of rotation of said shaft; and means for mounting each said screen surface with respect to said supporting structures so that a top portion of said screen surface is closer to its respective supporting structure than a bottom portion of said screen surface, providing an increased cross-sectional area of flow as suspension moves upwardly in said vessel.

4,468,320

INTEGRATED FLOTATION FILTRATION PLANT

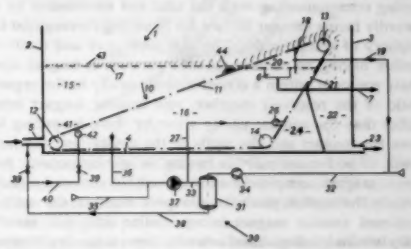
Friedrich-Karl Schmidt, St. Martins, New Brunswick, Canada EOG 2Z0

Continuation of Ser. No. 206,001, Nov. 20, 1980, abandoned. This application Jun. 23, 1982, Ser. No. 391,181

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946520

Int. Cl.³ B01D *33/04;* **C02F** *1/24*

U.S. Cl. 210—97 **33 Claims**



1. In an integrated flotation filtration plant including a flotation basin having side walls, a bottom, an inlet for supplying a liquid containing suspended matter, a flotation zone communicating with said inlet and including gas introducing means arranged proximate the bottom of said basin to generate a flow of rising gas bubbles adapted to adhere to and to flotate at least part of the matter suspended in said liquid introduced into said basin at said inlet, removal means for removing flotated mud from the surface of the body of said liquid, filter means extending over at least part of the length and depth of said basin through said liquid downstream of said flotation zone to define a flotation zone and a pure liquid zone, and an outlet located downstream of said filter means and provided for the discharge of purified liquid having a reduced content of said suspended matter, the improvement comprising;

a gas introducing device located in the region of the inlet including means to generate microdispersed gas bubbles within the volume of liquid entering the basin through said inlet, and said filter means comprising a traveling web-type filter means having a filtered surface extending substantially the depth of said basin and including a portion passing through the surface of the body of liquid, which filter means is arranged and adapted to co-act with the removal means so as to continuously remove non-flotable suspended matter as well as surface accumulated flotated mud from the body of liquid passing through said basin.

4,468,321

FILTER DEVICE WITH MAGNETIC FILTER CLAMP

Gerald D. St. John, Jackson, Mich., assignor to Gelman Sciences Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 357,394, Mar. 12, 1982, abandoned. This application Feb. 17, 1983, Ser. No. 465,899

Int. Cl.³ B01D *29/10*

U.S. Cl. 210—232 7 Claims

1. A filter device for filtering liquids comprising: a reservoir member of organic plastic for receiving the liquid to be filtered, said reservoir member having a base portion with an opening therethrough surrounded by a downwardly facing annular surface for receiving thereagainst the periphery of a filter disc; a spout member of organic plastic having a head portion with a tube depending downwardly therefrom for exit of the liquid after it is filtered, said head portion having an opening communicating with the tube and surrounded by an upwardly facing annular surface for receiving thereagainst the periphery of said filter disc; the base portion of said reservoir member having an annular ceramic permanent magnet completely enclosed within a closed annular cavity in the organic plastic of the reservoir member, said annular magnet being smaller than the annular cavity whereby there is spacing between the magnet and the walls of the cavity; and the head portion of said spout member having an annular ceramic permanent magnet completely enclosed within a closed annular cavity in the organic plastic of the spout member, the second-mentioned annular magnet being smaller than said annular cavity in which it is enclosed whereby there is spacing between said second-mentioned annular magnet and the walls of the cavity in which it is enclosed; the annular magnet of the spout member being positioned adjacent the annular magnet of the reservoir member when the spout member is assembled to the reservoir member with the filter disc therebetween whereby the magnetic attraction between the annular magnets causes the periphery of the filter disc to be sealingly clamped between said annular surfaces.

4,468,322

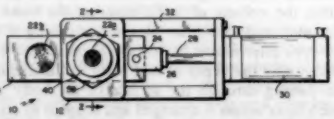
SLIDE PLATE SCREEN CHANGER

John E. Fogarty, Jr., Westboro, and Robert W. Anderson, Jr., Uxbridge, both of Mass., assignors to Thermoplas Machinery, Inc., Westboro, Mass.

Filed Jan. 17, 1983, Ser. No. 458,327

Int. Cl.³ B01D *29/02*

U.S. Cl. 210—236 8 Claims



1. A slide plate screen changer comprising:

a housing defining a flow passage for the material to be filtered, said housing having a slide plate passage communicating with and extending transversally across said flow passage;

a slide plate adapted to carry a plurality of filter screens, said slide plate being movable along said slide plate passage to position a selected one of said filter screens in said flow passage;

stationary abutment means adjacent to said slide plate passage on one side of said slide plate;

a sleeve axially received in said flow passage on the other side of said slide plate;

a first seal ring surrounding said flow passage and supported by said abutment means on the said one side of said slide plate;

a second seal ring surrounding said flow passage, said second seal ring being located on the other side of said slide plate and being carried in a circular groove in the end of said sleeve; and,

a bushing surrounding said sleeve, said bushing being threaded into said flow passage and being engageable with said sleeve to axially displace said sleeve and said second seal ring towards said first seal ring to tightly confine said slide plate between said seal rings.

4,468,323

METHOD AND APPARATUS FOR CLEANING UP SURFACE WATER

Wierd Koops, Zoetermeer, Netherlands, assignor to Staat der Nederlanden, The Hague, Netherlands

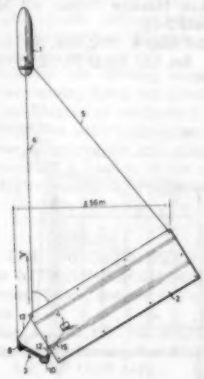
PCT No. PCT/EP81/00072, § 371 Date Feb. 11, 1982, § 102(e) Date Feb. 11, 1982, PCT Pub. No. WO81/03671, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 11, 1981, Ser. No. 348,059

Claims priority, application Netherlands, Jun. 12, 1980, 8003412

Int. Cl.³ E02B *15/04*

U.S. Cl. 210—776 8 Claims



1. A method for removing oil floating on water comprising the steps of towing in a predetermined direction a sweeping system having a pair of deflecting elements enclosing an angle of less than 180° as seen in the direction of towing, one of said elements comprising a floating scow towed at an angle of 60° to the direction of towing and a second of said elements being an arm extending from the aft end of the scow and having a solid stationary vertical wall extending along the length thereof, said arm and scow defining an angle of about 120°, guiding the oil swept by the sweeping system along a surface of said scow and onto said vertical wall of said arm and into a collection place near the trailing end of the arm, said arm being provided with a submersed pump located in said collection place and pumping oil and water mixture collected in the collection place into the scow for subsequent separation in the

scow, driving the pump by a mobile power unit located on the scow, and discharging water separated from the oil within the scow from the lower part of the scow whereby a scow fully loaded with oil can be replaced by an empty scow so as to continue the sweeping operation with a minimum of interruption.

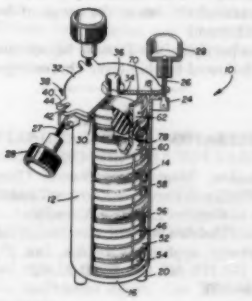
4. An apparatus for removing oil floating on water and comprising a sweeping system adapted to be towed by a two boat in a predetermined direction and having a pair of deflecting elements enclosing an angle of less than 180° as seen in the direction of towing, one of said elements comprising a floating scow and the other of said elements comprising a floating arm extending from the aft end of said scow and having a solid stationary vertical wall extending along the length thereof, said scow being disposed at an angle of about 60° to the direction of towing and said arm and scow defining an angle of about 120° such that oil on water is guided along a surface of said scow onto said vertical wall of said floating arm, a collecting place being provided near the trailing end of said arm to receive oil and water mixture guided along said vertical wall, a mobile power unit on said scow, a liquid pump submersed within said collecting place and drivingly connected to said mobile power unit, said liquid pump having discharge means connected to said scow such that oil and water mixture is pumped therein for subsequent separation, and means in said scow for discharging the separated water from the scow.

4,468,324

FILTRATION AND EXTRACTION APPARATUS

Brock W. de Lappe, Bodega Bay; Robert W. Risebrough; Wayman Walker, II, both of Berkeley, and Edwin H. Colledge, Vacaville, all of Calif., assignors to The Regents of the University of Calif., Berkeley, Calif.

Filed Jun. 7, 1982, Ser. No. 385,541
Int. Cl.³ B01D *29/14*
U.S. Cl. 210—350 **4 Claims**



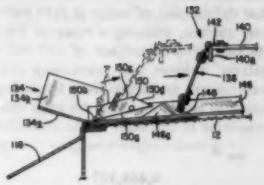
1. A filtration and extraction apparatus comprising
a housing having a passage;
a plurality of removable cages which are selectively positionable in said passage, each said cage including an upper and a lower ring, said upper ring defining an upper opening and said lower ring defining a lower opening and a passage connecting said upper opening and said lower opening, each cage further including means for holding said upper and lower ring in spaced relationship to each other;
means for filtration and extraction which is selectively positionable through one of said upper and lower openings into said passage of each said cage, which means is porous and compressible;
means for positioning each said cage within said passage and compressing a portion of said filtration and extraction means so as to prevent the channeling of fluid around said filtrating and extraction means;
said positioning and compressing means includes a plurality of cylindrical spacers which are selectively positionable through said upper and lower openings into said passage of said cages, each spacer having a height such that it extends substantially into said cages;
said spacers being disposed alternately in said passage of the housing with the cages with the filtration and extraction means, with spacers located on alternate sides of the cages compressing the filtration and extraction means therebetween so that the filtration and extraction means is no longer porous in the compressed area to define an internal third passage so as to prevent the channeling of fluid around said filtration and extraction means and between said spacers and said passage of said housing.

4,468,325

APPARATUS FOR EFFECTING CLARIFICATION OF LIQUID PROVIDED WITH FILTER CLEANING MEANS

Lewis M. Yock, Tigard, and Jack B. Burdick, Lake Oswego, both of Oreg., assignors to Globe Machine Manufacturing Company, Tacoma, Wash.

Filed Sep. 17, 1982, Ser. No. 419,500
Int. Cl.³ B01D *21/04*
U.S. Cl. 210—408 **10 Claims**



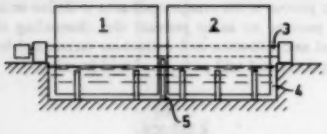
1. Apparatus for effecting clarification of liquid having particulate material entrained therewithin comprising:
filter means sized for passing the liquid therethrough while retaining the particulate material;
discharge means operable for directing the particulate-laden liquid against said filter means;
filter-cleaning means disposed adjacent said filter means including a dispensing means mounted on a carriage means operable for selective, reciprocal shifting relative to said filter means, said dispensing means being operable for directing a fluid flow against the filter means to impart movement of the retained particulate material relative to said filter means toward a downstream discharge end thereby removing the particulate material from said filter means and cleaning same;
liquid recovery means for returning to said filter means that liquid which may move downstream with the particulate material toward said discharge end, said liquid recovery means being defined by inclined means mounted adjacent said discharge end and displacement means defined by a plate means mounted on and extending forwardly from said carriage means operable for moving the particulate material toward said inclined means, said inclined means being inclined upwardly from said discharge end, and wherein a nonscreening expanse of predetermined length extends rearwardly from said inclined means; and
said plate means being mounted on said carriage means for nonengaging said filter means during carriage means reciprocation, said plate means also being mounted on said carriage means for slidably engaging said expanse during a predetermined length of shifting of said carriage means toward said inclined means and nonengaging said expanse during retraction of said carriage means from said inclined means.

4,468,326

PROCESS IN MICROBIOLOGICAL PURIFICATION AND A DEVICE AND MATERIALS THEREFOR

Kawe Kawert, Poppelvägen, Sweden, assignor to Jorgen Joiner, Sweden

Filed Jun. 29, 1982, Ser. No. 393,430
Int. Cl.³ C02F 3/08
U.S. Cl. 210—619 15 Claims



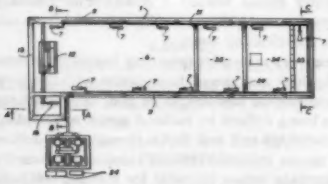
1. A process of microbiological degradation of organic matter in waste water, comprising rotating at least one biological contactor arranged in a basin containing a volume of said waste water to pump said waste water through said basin, the contactor being submerged in the water with a shaft of the contactor above the water surface to provide a substrate growth surface for microorganisms to bring said microorganisms into contact with air to degrade said organic material, said biological contactor being dimensioned relative to the water volume so that the amount of water is 1–10 liters of water per m^2 of substrate surface, utilizing a material for the contactor having a substrate growth surface of 150–400 m^2 per m^3 of contactor material volume, and preventing said waste water being pumped through said basin from bypassing said contactor by providing at least one baffle on each side of said basin extending transverse to the shaft of the contactor.

4,468,327

EFFLUENT TREATMENT

Arthur D. Brown, and Stephen G. B. Jones, both of 65 Ocean Ave., Double Bay, New South Wales 2028, Australia

Continuation of Ser. No. 323,592, Nov. 20, 1981, abandoned, which is a continuation of Ser. No. 224,862, Jan. 14, 1981, abandoned, which is a continuation of Ser. No. 81,293, Oct. 2, 1979, abandoned. This application Mar. 9, 1983, Ser. No. 471,907
Claims priority, application Australia, Oct. 3, 1978, PD6206; Feb. 16, 1979, PD7708
Int. Cl.³ C02F 3/12
U.S. Cl. 210—626 10 Claims



1. A method of treating effluent utilizing activated sludge comprising passing said effluent continuously into a tank provided with at least one transverse baffle across the tank and dividing said tank into a first portion adjacent said inlet and a second portion remote from said inlet, the volume ratio of said first portion to said second portion being between about 1:10 to about 1:3, said baffle having at least one aperture therethrough, said first portion being of such dimensions so as to operate at high immediate F/M ratios of up to 5 units, sludge with biological activity measured as oxygen uptake rate in units of milligrams of oxygen per gram of mixed liquor suspended solids per hour of up to 300 and a solids content of up to 15 pounds of biological solids per square foot of vessel floor area and said tank operating at an overall F/M ratio of up to 0.4;

aerating and mixing said effluent, at least in said second portion of the tank, so as to provide a sludge with good settlement properties;

ceasing said aeration and mixing while still allowing effluent to enter said tank through said inlet;

allowing sludge in said second portion to settle;

decanting treated effluent from said second portion of said tank at a point remote from said inlet;

and repeating said aerating, settling and decanting to treat further effluent.

4,468,328

PURIFICATION OF 12-O-TETRADECANOYLPHORBOL-13-ACETATE, PHORBOL, AND 4α-PHORBOL FROM CROTON OIL

Alan D. Kinghorn, and Gary T. Marshall, both of Chicago, Ill., assignors to The Board of Trustees of the University of Ill., Urbana, Ill.

Filed Jan. 17, 1983, Ser. No. 435,070
Int. Cl.³ B01D 15/08
U.S. Cl. 210—634 9 Claims

1. A method for isolating 12-O-tetradecanoylphorbol-13-acetate(TPA) in high purity from croton oil comprising the steps of

(a) extracting the croton oil with an aqueous alcohol solution to obtain a crude TPA extract;

(b) purifying the crude TPA extract by droplet counter-current chromatography(DCCC) wherein the mobile and stationary phases are derived from an equilibrated mixture of hexane-diethylether-n-propanol-ethanol-water, the separated upper layer of which comprises the stationary phase and the bottom layer of which the mobile phase, and the composition of which mixture is such that the distribution coefficient for TPA, as defined by the ration of its concentration in the stationary phase divided by that in the mobile phase, lies in the range of from about 3.0 to about 12.0; and

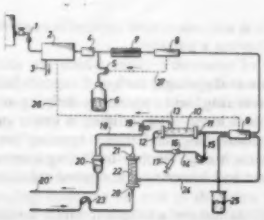
(c) further purifying the TPA by liquid-column chromatography followed by thin-layer chromatography.

4,468,329

HEMOFILTRATION SYSTEM AND SAFETY SYSTEM THEREFOR

Stanley Shaldon, Montpellier, France; Claes-Ake Gullberg, Covina, Calif., and Lars-Ake Larsson, Löddeköpinge, Sweden, assignors to Gambro Lundia AB, Sweden

Filed Jun. 4, 1981, Ser. No. 270,492
Claims priority, application Sweden, Jun. 27, 1980, 8004795
Int. Cl.³ B01D 31/00
U.S. Cl. 210—651 29 Claims



1. Apparatus for hemofiltration of a supply of blood withdrawn from a patient and for the return to the patient of an infusate solution and filtered blood after hemofiltration, said apparatus comprising purified water supply means for purifying an impure supply of water provided from a source of impure water which is separate from said supply of blood and

adding concentrate thereto so as to provide a replacement liquid stream comprising a purified water stream including said concentrate, the amount of said replacement liquid stream being such that substantially the entire infusate solution to be returned to the patient is derived from said replacement liquid stream; filtration means for filtering said supply of blood and said replacement liquid stream, said filtration means comprising a first semipermeable hemofiltration membrane for hemofiltration of said supply of blood and a second semipermeable membrane for filtration of said replacement liquid stream; contact means for contacting said supply of blood and said replacement liquid stream with said filtration means so as to produce a filtered blood stream and an ultrafiltration stream from said supply of blood and an infusate filtrate stream from said replacement liquid stream, said contact means including blood inlet means for supplying said supply of blood to said first semipermeable hemofiltration membrane, replacement liquid inlet means for supplying said replacement liquid stream to said second semipermeable membrane, filtered blood outlet means for withdrawing said filtered blood stream from said first semipermeable hemofiltration membrane, ultrafiltrate outlet means for withdrawing said ultrafiltration stream from said first semipermeable hemofiltration membrane, filtrate outlet means for withdrawing said infusate filtrate stream from said second semipermeable membrane, and replacement liquid outlet means for withdrawing said replacement liquid stream which does not pass through said second semipermeable membrane from said second semipermeable membrane; return means for returning said filtered blood stream and said infusate filtrate stream to said patient whereby substantially the entire infusate solution returned to said patient is derived from said replacement liquid stream; and recirculation means for recirculating said replacement liquid stream withdrawn from said replacement liquid outlet means to said replacement liquid inlet means, said recirculation means including safety means for detecting failures in said second semipermeable membrane, said safety means comprising indicator supply means for supplying an indicator which will not normally pass through said second semipermeable membrane to said replacement liquid stream in said recirculation means, and detector means associated with said filtrate outlet means, said detector means being capable of detecting the presence of said indicator in said infusate filtrate stream.

4,468,330

FILLER FOR LIQUID CHROMATOGRAPHY USEFUL FOR SEPARATING A HEMOGLOBIN VARIANT IN BLOOD

Fumio Kamiyama; Minoru Kohara, both of Kyoto; Mituo Nagata, Shiga, and Yasuhiko Araki, Amagasaki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

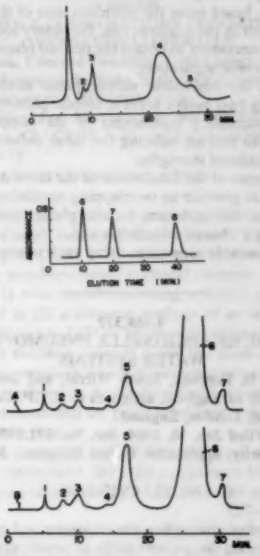
Filed Apr. 23, 1982, Ser. No. 371,491

Claims priority, application Japan, Apr. 27, 1981, 56-64812; Jun. 25, 1981, 56-99451

Int. Cl.³ B01D *15/08;* **C08F** *220/20*

U.S. Cl. 210—656 **3 Claims**

1. A method for separating a hemoglobin variant in blood which comprises subjecting it to liquid chromatography using a filler, said filler consisting essentially of a hydrophilic ion-exchanger obtained by copolymerizing a mixture of (A) 5 to 90% by weight of a polymerizable monomer containing one polymerizable double bond and at least one carboxyl group per molecule and having a hydrophobic parameter of not more than 2.3, (B) 10 to 95% by weight of a crosslinkable polymerizable monomer containing at least two polymerizable double bonds per molecule and having a hydrophobic parameter of not more than 2.3, and (C) up to 85% by weight of a monomer being different from the monomer (A), containing one polymerizable double bond per molecule and having a hydrophobic parameter of not more than 2.3, wherein the monomer (A) is selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid and maleic acid, the monomer (B) is selected from the group consisting of tetramethylolmethane tri- and tetraacrylates and -methacrylates, trimethylolethane triacrylates and trimethacrylates, dipentaerythritol hexaacrylate and hexamethacrylate and tetraethylene glycol dimethacrylate, and the monomer (C) is selected from the group consisting of N,N-dimethylacrylamide, N,N-dimethylmethacrylamide, 2-hydroxyethyl acrylate and, 2-hydroxyethyl glycidyl acrylate and glycidyl, glycidyl acrylate and glycidyl methacrylate.



4,468,331

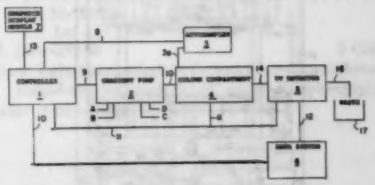
METHOD AND SYSTEM FOR LIQUID CHORMATOGRAPHY SEPARATIONS

Paul E. Antle, Newark, Del.; John A. Schmit, Elkton, Md., and Edward L. Smith, Jackson, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 13, 1982, Ser. No. 417,519

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—659 **3 Claims**



1. A method for automatically effecting liquid chromatography separations of a multicomponent sample using a mobile phase having three selectivity adjusting solvents and using a liquid chromatograph column having an automatic sampler module for introducing samples into the column comprising the steps of:

selecting three solvents each contributing to a different one of the factors proton acceptor, proton donor, dipole inter-

action which contribute to total mobile phase selectivity along with a strength adjusting solvent for either reversed phase or normal phase chromatographic separations;

effecting a chromatographic separation of the sample under a gradient condition which adjusts the strength of one of said three selectivity adjusting solvents with said strength adjusting solvent;

calculating, based upon the retention time of the last sample component in the gradient run, the binary solvent composition E_1 necessary to obtain the desired retention factor k' in an isocratic separation;

calculating the equivalent mobile phase strengths for the remaining two binary solvent mobile phases;

effecting successive separations of the sample and each component thereof utilizing the three defined solvents at their calculated strengths;

utilizing blends of the fixed ratios of the three defined binary solvents to provide an overlapping resolution map and to determine the optimum mobile phase composition for obtaining a chosen selectivity; and

effecting a sample separation using such optimum composition.

4,468,332

CONTROL OF LEGIONELLA PNEUMOPHILA IN WATER SYSTEMS

Jonathan H. B. Peacock, South Wirral, and John B. Kurtz, Oxford, both of England, assignors to B.T.P. Cocker Chemicals Limited, London, England

Filed Jan. 16, 1984, Ser. No. 571,180

Claims priority, application United Kingdom, Jan. 21, 1983, 8301600

Int. Cl.³ C02F *1/50*

U.S. Cl. 210—755 **6 Claims**

1. A method of controlling the incidence and growth of the bacterium Legionella pneumophila in water systems of the recirculating type which comprises adding to the water in said water system a bactericidally effective amount of 2,2'-dihydroxy-5,5'-dichloro diphenyl sulphide.

4,468,333

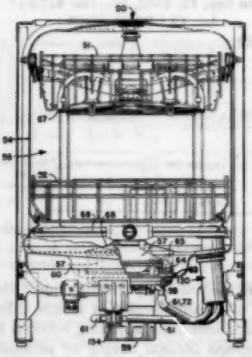
METHOD FOR A WAREWASHER BYPASS SOIL COLLECTOR

Paul B. Geiger, Piqua, Ohio, assignor to Hobart Corporation, Troy, Ohio

Division of Ser. No. 247,449, Mar. 25, 1981, Pat. No. 4,346,723. This application Aug. 11, 1982, Ser. No. 407,233

Int. Cl.³ B01D *23/04*; B08B *3/02*

U.S. Cl. 210—798 **2 Claims**



1. A method of collecting and removing food soil particles from a wash chamber of a dishwasher of the type having primary spray means for recirculating and spraying fluid onto food ware items received within said wash chamber to remove food soil particles from food ware items and carry them to a sump at the bottom of said chamber, and a drain system including a pump for pumping fluid from the sump bottom to a drain, comprising the steps of:

(a) recirculating fluid, independently of said primary spray means, from said sump through a soil collecting circuit by means of said drain system pump and thence back to said wash chamber,

(b) filtering fluid flowing through said soil collecting circuit by passing substantially all fluid flowing through said soil collecting circuit through a fine screen filter, thereby removing food soil particles suspended in the fluid and holding them separate from said wash chamber, and

(c) subsequently discharging food soil particles removed by said filtering step through said drain system when said drain pump is operated to drain fluid from said dishwashing machine.

4,468,334

AQUEOUS DRILLING FLUID AND MOBILITY CONTROL SOLUTION FOR USE ON RECOVERY

Roger B. Cox, Reading, and David C. Steer, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 331,705, Dec. 16, 1981, , which is a division of Ser. No. 166,220, Jul. 7, 1980, Pat. No. 4,329,448. This application Aug. 23, 1982, Ser. No. 410,688

Claims priority, application United Kingdom, Jul. 10, 1979, 7924040; Dec. 20, 1979, 7943878

Int. Cl.³ C09K *7/02*; E21B *43/22*

U.S. Cl. 252—8.5 C **7 Claims**

1. An aqueous drilling fluid comprising an aqueous medium containing from 0.05 to 3% by weight of Biopolymer PS 87 said Biopolymer PS 87 being a heteropolysaccharide which comprises from 40 to 45% by weight of glucose, from 10 to 20% by weight galactose, from 25 to 30% by weight mannose, from 6 to 13% by weight glucuronic acid and from 0 to 1.5% by weight fucose, a 1% by weight solution of said Biopolymer PS 87 having pseudoplastic properties, a consistency at 20° C. of at least 150 poise and a yield stress value of 20° C. of at least 30 dynes/cm^2.

5. An aqueous mobility control solution for use in oil recovery comprising an aqueous fluid of from 0.005 to 0.5% by weight of Biopolymer PS 87 said Biopolymer PS 87 being a heteropolysaccharide which comprises from 40 to 45% by weight of glucose, from 10 to 20% by weight galactose, from 25 to 30% by weight mannose, from 6 to 13% by weight glucuronic acid and from 0 to 1.5% by weight fucose, a 1% by weight solution of said Biopolymer PS 87 having pseudoplastic properties, a consistency at 20° C. of at least 150 poise and a yield stress value at 20° C. of at least 30 dynes/cm^2.

4,468,335

BRANCHED ALKYLPOLYETHOXYPROPANE SULFONATES AND THEIR USE IN ENHANCED OIL RECOVERY

Catherine S. H. Chen, Berkeley Heights, and Albert L. Williams, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 259,215, Apr. 30, 1981, , and Ser. No. 259,216, Apr. 30, 1981,. This application Apr. 30, 1982, Ser. No. 373,550

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **9 Claims**

1. A compound having the formula

$$RO(C_2H_4O)_xCH_2CH_2CH_2SO_3Na$$

in which

R is a branched aliphatic radical containing 10 to 30 carbon atoms,

in which R is the alkyl group in which R_2 contains 2 to 10 carbon atoms, R_3 contains 6 to 26 carbon atoms and x is 2 to 6.

4,468,336

LOW DENSITY LOOSE FILL INSULATION

Ivan T. Smith, 401 McDaniel Rd., NW., Marietta, Ga. 30064

Filed Jul. 5, 1983, Ser. No. 510,622
Int. Cl.³ C04B 43/12; E04B 1/76
U.S. Cl. 252—62 6 Claims

1. A loose fill insulation for use as a low settled density heat insulator in a building structure comprising a mixture of loose fill cellulosic insulation and staple fibers from a group of fibers consisting of polypropylene, acetate, acrylic, vinyl, polyethelyene, and polyester.

4,468,337

PROCESS FOR THE HEATING AND/OR THERMAL CONDITIONING OF A BUILDING BY MEANS OF A HEAT PUMP OPERATED WITH A SPECIFIC MIXTURE OF WORKING FLUIDS

Claude Ramet, Paris, and Alexandre Rojey, Garches, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 381,903, May 25, 1982, Pat. No. 4,428,853. This application Sep. 14, 1983, Ser. No. 532,128
Claims priority, application France, Oct. 19, 1981, 81 19734
Int. Cl.³ C09K 5/04
U.S. Cl. 252—67 6 Claims

1. In a cyclic process for heat condition a building by means of a compression heat pump operated with a working fluid, the process comprising the repeated successive steps of (a) compressing a gas phase of a working fluid, (b) cooling the compressed gas phase of the working fluid obtained in step (a), in contact with a cooling fluid at a temperature from about 20° to 75° C., to form a condensed liquid phase of the working fluid, (c) expanding the liquid phase of the working fluid obtained in step (b) and vaporizing at least a portion of the expanded liquid phase of step (c) in contact with a heating fluid at a temperature from about −15° to +40° C. to reconstitute the gas phase of step (a), the improvement comprising using as the working fluid a composition of:

(a) 95–80% by mole of
  (i) R12 being dichlorodifluoromethane,
  (ii) R500 being by weight 73.8% dichlorodifluoromethane and 26.2% difluoroethane, or
  (iii) R501 being by weight 75% chlorodifluoromethane and 25% dichlorodifluoromethane; and
(b) 5–20% by mole of
  (i) R23 being trifluoromethane, or
  (ii) R503 being by weight 40.1% trifluoromethane and 59.9% chlorotrifluoromethane.

4,468,338

TRANSPARENT SOAP COMPOSITION

Gordon A. Lindberg, Fullerton, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Jun. 13, 1983, Ser. No. 503,740
Int. Cl.³ C09K 15/02, 15/06; C11D 9/10, 17/00
U.S. Cl. 252—105 14 Claims

1. A transparent soap composition characterized by improved stability against darkening and loss of transparency, consisting essentially of

(a) over 50% by weight of a complex mixture of the sodium and triethanolamine salts of a fatty acid or acids having from 6 to 18 carbon atoms and an iodine value of 8–15,
(b) between 0.1 and 1.0 weight percent of a member or members selected from the group consisting of citric acid, sodium citrate and potassium citrate,
(c) between 0.3 and 1.0 weight percent of a member or members selected from the group consisting of sodium metabisulfite, and potassium metabisulfite, and
(d) water,
(e) the sum of the weight precentages of the (b) and (c) composition members being at least about 0.5 weight percent.

4,468,339

AQUEOUS COMPOSITIONS CONTAINING OVERBASED MATERIALS

Joseph J. Rysek, Concord Township, Lake County, and John W. Forsberg, Mentor on the Lake, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jan. 21, 1982, Ser. No. 340,211
Int. Cl.³ C10M 1/10, 1/16, 1/32, 3/04
U.S. Cl. 252—75 62 Claims

1. An aqueous composition comprising:

(A) water;
(B) an overbased material dispersed with component (A), said overbased material being selected from the group consisting of (B)(I) a Newtonian overbased material or (B)(II) a non-Newtonian colloidal disperse system comprising (1) solid metal-containing colloidal particles predispersed in (2) a disperse medium of at least one inert organic liquid and (3) as an essential third component at least one member selected from the class consisting of organic compounds which are substantially soluble in said disperse medium, the molecules of said organic compound being characterized by polar substituents and hydrophobic portions; and
an effective amount of at least one additional component to disperse component (B) with component (A), said additional component being selected from the group consisting of
(C) at least one nitrogen-containing, phosphorus-free carboxylic solubilizer made by the reaction of (C)(I) at least one carboxylic acid acylating agent having at least one hydrocarbon-based substituent of about 12 to about 500 carbon atoms with (C)(II) at least one (a) N-(hydroxyl-substituted hydrocarbyl)amine, (b) hydroxyl-substituted poly(hydrocarbyloxy) analog of said amine or (c) mixture of (a) and (b),
(D) at least one surfactant, or
(E) mixture of (C) and (D).

4,468,340

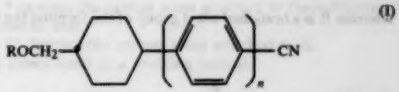
LIQUID-CRYSTALLINE PHENYLCYCLOHEXANE DERIVATIVES

Hiromichi Inoue; Takashi Inukai; Yasuyuki Goto; Hideo Sato, and Masahiro Fukui, all of Yokohamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 27, 1982, Ser. No. 425,162
Claims priority, application Japan, Oct. 4, 1981, 56-176698; Oct. 7, 1981, 56-159593
Int. Cl.³ C09K 3/34; C07C 121/75
U.S. Cl. 252—299.63 6 Claims

1. Trans-4-alkyloxymethyl-1-(4'-cyanophenyl)cyclohexanes and trans-4-alkyloxymethyl-1-(4''-cyano-4'-biphenylyl)cyclohexanes expressed by the general formula

(I)



wherein R represents an alkyl group of 1 to 8 carbon atoms and n represents 1 or 2.

5. A liquid crystalline dielectric composition having at least 2 components, one of which is selected from the compounds set forth in claim 1.

4,468,341
STABLE PURIFIED AQUEOUS SOLUTIONS OF FLUORESCENT WHITENING AGENT

Bryan Beyer, Mobile, Ala., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,149
Int. Cl.³ C09K *11/06*
U.S. Cl. 252—301.23 **10 Claims**

1. A process for preparing the fluorescent whitening agent, 4,4'-bis(4-p-sulfoanilino-6-diisopropanolamino-s-triazin-2-ylamino)-2,2'-stilbenedisulfonic acid tetra sodium salt, in stable form without cosolvents which comprises the steps of

(a) condensing substantially two mols of cyanuric chloride with one mol of an alkali metal salt of 4,4'-diaminostilbene-2,2'-disulfonic acid to form a first intermediate, bis-3,5-dichloro-s-triazin-2-stilbene disulfonic acid alkali metal salt;

(b) reacting said first intermediate with two mols of p-sulfanilic acid alkali metal salt to form a second intermediate, 4,4'-bis(4-p-sulfoanilino-6-chloro-s-triazin)-2,2'-stilbenedisulfonic acid tetraalkali metal salt, as a precipitate;

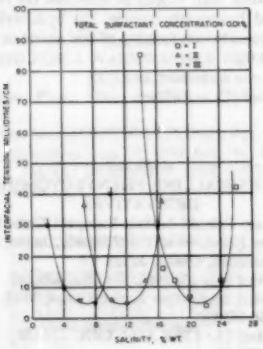
(c) washing said precipitate to reduce the content of inorganic salts therein; and

(d) converting said second intermediate to said fluorescent whitening agent by heating said precipitate in water with substantially two mols of diisopropanolamine in water to form an aqueous solution of said fluorescent whitening agent product.

4,468,342
BLENDS OF SURFACTANT HOMOLOGUES ADJUSTED TO SALINITY DURING WATERFLOODING

Catherine S. H. Chen, Berkeley Heights, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

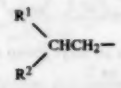
Filed Oct. 13, 1981, Ser. No. 310,545
Int. Cl.³ B01F *17/02*
U.S. Cl. 252—353 **6 Claims**



1. A blend of at least two homologous surfactants having the formula:

$$R(OC_2H_4)n—OCH_2CH_2CH_2SO_3Na$$

wherein R is a branched alkyl group of the formula the formula



in which R^1 and R^2 are the same or different C_4–C_8 alkyl, the total number of carbon atoms in R is between 10 and 30, and n is between 2 and 6; the molar ratio of the homologs in the blend being between about 3:1 and about 1:3, and wherein said homologous surfactants have different numbers of carbon atoms in the branched alkyl groups thereof.

4,468,343
POLYMERIZATION CO-INHIBITORS FOR VINYL AROMATIC COMPOUNDS

James R. Butler; James M. Watson; Debra L. Kendall, all of Big Spring, and Karen A. Mikkelson, Lubbock, all of Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Apr. 11, 1983, Ser. No. 483,976
Int. Cl.³ C09K *15/22*; C08F *2/38*
U.S. Cl. 252—403 **7 Claims**

1. A composition for inhibiting polymerization of a vinyl aromatic compound in the presence of oxygen, comprising

(a) an effective amount of 2,6-dinitro-p-cresol; and

(b) an effective amount of a phenylenediamine having the formula

wherein R_1 and R_2 are alkyl, aryl or hydrogen.

4,468,344
METHOD OF FRACTIONAL COLLECTION OF GASTRIC ACID SECRETION INHIBITING COMPONENTS

Hajime Hiratani, Senaan; Naomi Uchida, Takarazuka, and Toyohiko Nishimura, Ashiya, all of Japan, assignors to Japan Chemical Research Co., Ltd., Hyogo, Japan

Filed Jan. 27, 1983, Ser. No. 461,383
Claims priority, application Japan, Feb. 2, 1982, 57-16000
Int. Cl.³ C07G *7/00, 15/00*; C08H *1/00*
U.S. Cl. 260—112 R **6 Claims**

1. A method of isolating gastric acid secreting inhibiting substances from body fluids containing the same comprising:

(a) subjecting said fluid to at least one fractionation method selected from gel filtration, adsorption and desorption using an ion exchanger and electrophoresis to obtain a first substance having a molecular weight of about 100,000 and an isoelectric point of 5.6 and a second substance having a molecular weight of about 6,000 and an isoelectric point of about 4.6;

(b) determining the presence of said first and second substance by subjecting the same to the Shay pyloric ligation test and the Lai perfusion test, wherein said first component is substantially active by the Shay test and substantially inactive by the Lai test and wherein said second component is substantially active by the Lai test and substantially inactive by the Shay test.

4,468,345
PROTEIN (PP_{17}), A PROCESS FOR CONCENTRATING AND ISOLATING IT AND ITS USE

Hans Bohn, Marburg an der Lahn, and Wilhelm Winckler, Wenkbach, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,349
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228503
Int. Cl.³ C07G *7/00*; A61K *35/42, 35/50, 39/395*
U.S. Cl. 260—112 R **5 Claims**

1. A protein, PP_{17}, extracted from placental tissue, having

(a) an electrophoretic mobility in the range between β_1- and α_2-globulins;

(b) an isoelectric point of 5.25±0.20;

(c) a sedimentation coefficient $S_{20°,w}$ of 2.7±0.1 S;
(d) a molecular weight, determined in polyacrylamide gel containing sodium dodecyl sulfate (SDS), of 38,000±2,000;
(e) an extinction coefficient $E_{1\ cm}^{1\%}$ (280 nm) of 8.5±0.4;
(f) a carbohydrate content of 2.1±0.9% containing 0.3±0.2% of mannose, 0.4±0.2% of galactose, 0.2±0.1% of xylose, 1.0±0.3% of N-acetyl-glycosamine and 0.2±0.1% of N-acetyl-neuramin acid; and
(g) an amino acid analysis of

Amino Acid	Mol %	Variation Coefficient
Lysine	5.86	5.52
Histidine	2.16	36.37
Arginine	5.30	2.90
Aspartic acid	7.44	2.59
Threonine	4.41	9.80
Serine	9.14	4.73
Glutamic acid	18.52	2.94
Proline	4.41	5.13
Glycine	4.93	2.92
Alanine	8.56	1.55
Cystine /2	0.75	3.58
Valine	6.91	3.53
Methionine	1.46	7.89
Isoleucine	2.53	4.70
Leucine	11.39	1.55
Tyrosine	1.43	11.97
Phenylalanine	2.79	7.29
Tryptophan	1.97	8.41.

4,468,346

MONOCLONAL ANTIBODIES TO PORCINE IMMUNOGLOBULINS

Prem S. Paul, and Richard A. Van Deusen, both of Ames, Iowa, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 27, 1983, Ser. No. 546,220
Int. Cl.³ A61K *39/395;* **C12N** *5/00, 1/26;* **C12Q** *1/00*
U.S. Cl. 260—112 B **16 Claims**

1. Monoclonal antibody which is heavy-chain specific for porcine immunoglobulin.

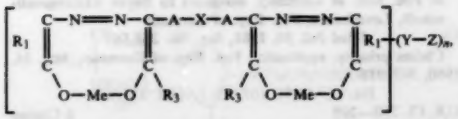
4,468,347

SULFO GROUP-FREE DISAZO AND POLYAZO COMPOUNDS CONTAINING AT LEAST TWO BASIC OR CATIONIC GROUP AND WHICH ARE IN METAL-FREE OR 2:1 METAL COMPLEX FORM

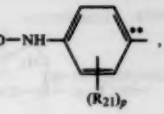
Paul Doswald, Münchenstein; Emil Moriconi, Basel; Helmut Moser, Oberwil, and Horst Schmid, Reinach, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 261,320, May 7, 1981, abandoned. This application Mar. 24, 1982, Ser. No. 361,183
Int. Cl.³ C09B *44/04, 44/08, 45/24, 45/28*
U.S. Cl. 260—147 **20 Claims**

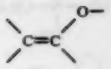
1. A 2:1 metal complex of the formula



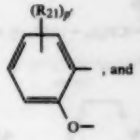
wherein each A is independently



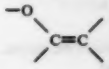
each R_1 and the



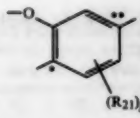
radical to which it is attached, taken together, independently, are



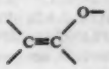
each R_3 is independently C_{1-4}alkyl, or each A, R_3 and the



radical to which they are attached, taken together, independently, are



each R_1 and the



radical to which it is attached, taken together, independently, are the radical of an aromatic carbocyclic or heterocyclic coupling component,

wherein each

R_{21} is independently chloro, bromo, C_{1-4}alkyl or C_{1-4}alkoxy,

p is 0, 1 or 2,

p' is 0 or 1,

the * denotes the carbon atom attached to the —N=N— radical, and

the ** denotes the carbon atom attached to X,

X is a direct bond or a bridging radical,

each

Y is independently a direct bond, C_{1-4}alkylene, —CO—NH—$(CH_2)_m$—***, —NH—CO—$(CH_2)_m$—*** or —SO_2—NR_4—$(CH_2)_m$—***,

wherein

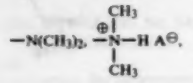
R_4 is hydrogen or C_{1-4}alkyl,

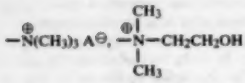
m is 1, 2, 3 or 4, and

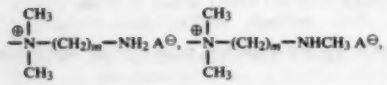
the *** denotes the carbon atom attached to Z,

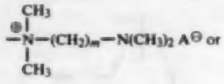
each

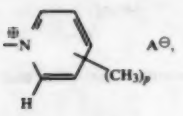
Z is independently











wherein

$A^{\ominus}$ is a non-chromophoric anion,

m is 1, 2, 3 or 4, and

p is 0, 1 or 2,

each

Me is independently copper, cobalt, iron, nickel, manganese or zinc, and

n is at least 2,

with the proviso that the 2:1 metal complex is free of sulfo groups.

4,468,348

TRISAZO DYES HAVING A 4-(1-AMINO-3,6-DISULFO-8-HYDROXY-7-PHENYLAZONAPHTHYL-2-AZO)PHENYLAZO GROUP LINKED TO A COUPLING COMPONENT RADICAL

Heinz Wicki, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

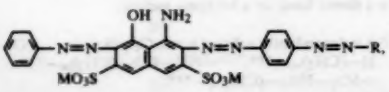
Continuation of Ser. No. 746,482, Dec. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 614,378, Sep. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 398,583, Sep. 19, 1973, abandoned. This application Feb. 4, 1980, Ser. No. 118,595

Claims priority, application Switzerland, Sep. 26, 1972, 14028/72; Oct. 20, 1972, 15413/72; Oct. 4, 1974, 13378/74; Jul. 25, 1975, 9735/75

Int. Cl.³ C09B *31/16, 31/20, 31/24, 31/28*

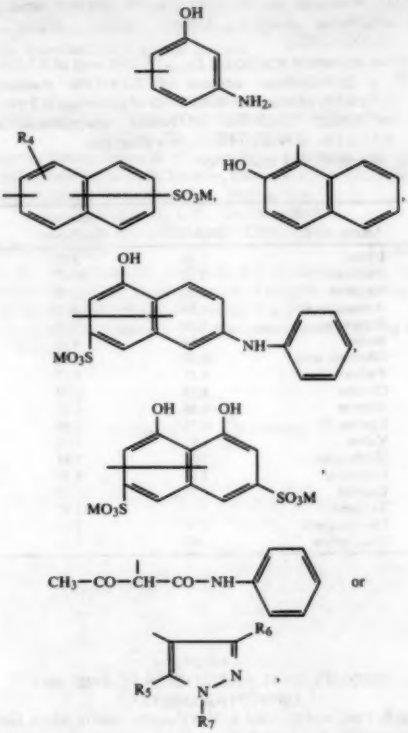
U.S. Cl. 260—159 **37 Claims**

1. A compound of the formula



or a mixture of such compounds,

wherein R is



wherein R_4 is hydroxy, $-NH_2$, anilino or toluidino, R_5 is hydroxy, C_{1-6}alkylsulfonyloxy, phenylsulfonyloxy, $-NH_2$, C_{1-6}alkylsulfonylamino or phenylsulfonylamino,

R_6 is C_{1-6}alkyl, C_{1-6}alkoxy, acetyl, carboxy or carbamoyl, and

R_7 is hydrogen; (C_{1-6}alkyl)carbonyl; benzoyl; C_{1-6}alkyl; C_{1-6}alkyl substituted by C_{1-6}alkoxy, chloro, cyano or hydroxy; phenyl; phenyl substituted by $-SO_3M$, nitro, cyano or $-NH_2$ or by 1 to 3 substituents independently selected from the group consisting of halo, C_{1-6}alkyl and C_{1-6}alkoxy; naphthyl or naphthyl monosubstituted or disubstituted by $-SO_3M$, wherein each halo is independently fluoro, chloro or bromo, and

each M is hydrogen or a cation.

4,468,349

PROCESS FOR THE PREPARATION OF SOLUTIONS OF CATIONIC AZO DYESTUFFS

Karl Linhart, Leverkusen; Harald Gleinig, Odenthal-Neschen; Günther Boehmke, Leverkusen, and Kurt Breig, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

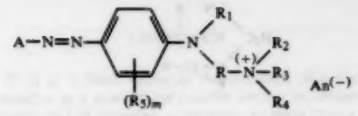
Filed Jul. 30, 1981, Ser. No. 288,567

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3030918

Int. Cl.³ C07C *107/06, 107/08, 107/04*

U.S. Cl. 260—205 **6 Claims**

1. In the preparation of concentrated stable solutions of cationic azo dyestuffs of the formula



wherein

A denotes the radical of an aromatic-carbocyclic or aromatic-heterocyclic diazo component,

R denotes alkylene,

R_1 denotes hydrogen or alkyl,

R_2 denotes alkyl, alkenyl or aralkyl,

R_3 denotes alkyl,

R_4 denotes hydroxyalkyl with 2 or more C atoms,

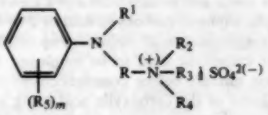
R_5 denotes halogen, alkyl, alkoxy, aryloxy, acyl or acylamino,

m denotes 0, 1, 2, 3 or 4 and

$An^{(-)}$ denotes a carboxylate ion,

and wherein the cyclic and acyclic substituents can carry further non-ionic substituents, which solutions have a low salt content, by coupling, the improvement which comprises simultaneously reacting amines of the formula

coupling components of the formula



and alkali metal nitrites or alkaline earth metal nitrites in aqueous carboxylic acids, and separating off the alkali metal sulphates or alkaline earth metal sulphates which thereby crystallize out.

4,468,350

KA-6643-SERIES ANTIBIOTICS, PROCESS FOR PRODUCING SAME AND MEDICAL COMPOSITION CONTAINING SAME

Masao Okuchi, Tokorozawa; Masahito Nakayama, Higashi-Yamato; Akio Iwasaki, Kawasaki; Shigeru Kimura, Tachikawa; Toshimi Mizoguchi, Higashi-Murayama; Sohei Tanabe, Higashi-Murayama; Akira Murakami, Higashi-Murayama; Hisakatsu Ito, Kawagoe, and Toshihito Mori, Higashi-Murayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

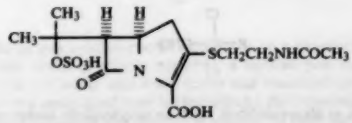
Filed Oct. 22, 1981, Ser. No. 314,028

Claims priority, application Japan, Oct. 24, 1980, 55-149177; Mar. 6, 1981, 56-31983; Jul. 27, 1981, 56-117449

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.2 T **4 Claims**

1. A KA-6643-series antibiotic comprising at least one substance represented by any of the following formulae, or a pharmaceutically acceptable salt or ester thereof:



(1)

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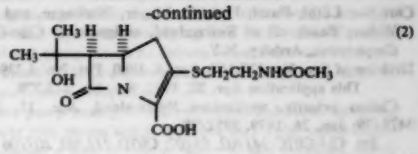
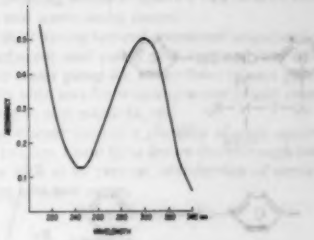
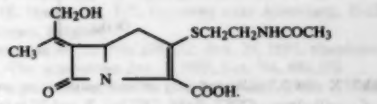


(2)





(3)

4,468,351

PROCESS FOR DEBROMINATION OF DIBROMOPENICILLANIC ACID AND DERIVATIVES

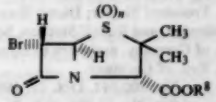
Donald K. Pirie, Uncasville, and Paul D. Weeks, Gales Ferry, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,731

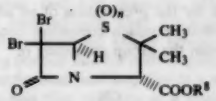
Int. Cl.³ C07D *499/00*; A61K *31/425*

U.S. Cl. 260—245.2 R **15 Claims**

1. A process for the preparation of a monobromo compound of the formula



wherein n is 0, 1 or 2 and R^8 is hydrogen, a conventional carboxy protecting group removable by hydrogenolysis or a conventional ester forming radical which is hydrolyzable under physiological conditions, which comprises treatment of a dibromo compound of the formula



wherein n and R^8 are as previously defined, with substantially one molar equivalent of a bisulfite salt in a reaction-inert aqueous solvent at 0°–100° C.

4,468,352

DISTYRYLBIPHENYLS

Christian Lüthi, Basel; Hans R. Meyer, Binningen, and Kurt Weber, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

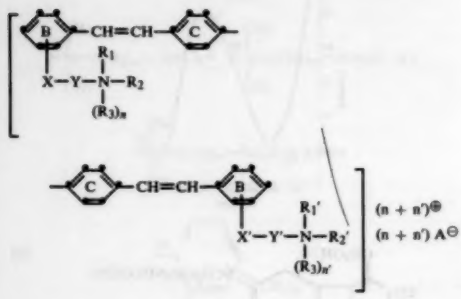
Division of Ser. No. 137,147, Apr. 4, 1980, Pat. No. 4,339,393. This application Apr. 28, 1982, Ser. No. 372,779

Claims priority, application Switzerland, Apr. 11, 1979, 3478/79; Jun. 26, 1979, 5952/79

Int. Cl.³ C07C *141/02, 93/02;* C07D *211/00, 207/06*

U.S. Cl. 260—459 A **7 Claims**

1. A distyrylbiphenyl of the formula



in which X and X' independently of one another are sulfur, —O—C_{1-3}-alkylene—COO— or —OCO—, Y and Y' independently of one another are C_{1-20}-alkylene or C_1–C_{20}-hydroxyalkylene, R_1, R_1', R_2 and R_2' independently of one another are C_{1-8}-alkyl or C_{3-4}-alkenyl, R_3 is hydrogen, C_{1-4}-alkyl or C_{3-4}-alkenyl, or R_1 and R_2 or R_1' and R_2' together with the N atom to which they are attached, is pyrrolidine, piperidine, hexamethyleneimine or morpholine, or R_1 and R_2, or R_1' and R_2', together with R_3 and the N atom to which they are attached, are pyridine or picoline, $A^{\ominus}$ is a colorless anion and n and n' independently of one another are 0 or 1, the benzene rings B and C can also be substituted by halogen, C_{1-4}-alkyl, C_{3-4}-alkenyl or C_{1-3}-alkoxy, and the benzene rings B can also be substituted by a trimethylene or tetramethylene group.

4,468,353

METHOD OF PREPARING ALKOXYMETHYLENE COMPOUNDS

Otto Ackermann, Troisdorf Sieglar; Dieter Bretzinger, Lohmar; Herbert Schneidewind, and Rudolf Stephan, both of Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 200,841, Oct. 27, 1980, abandoned, which is a division of Ser. No. 15,096, Feb. 26, 1979, Pat. No. 4,277,418, which is a continuation-in-part of Ser. No. 825,794, Aug. 9, 1977, abandoned. This application Sep. 30, 1982, Ser. No. 432,051

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635841

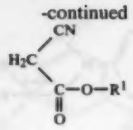
Int. Cl.³ C07C *120/00, 121/30, 121/453, 121/413*

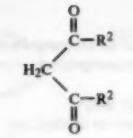
U.S. Cl. 260—465.4 **6 Claims**

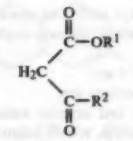
1. In a process for the preparation of an alkoxymethylene malonic acid derivative which comprises contacting a compound selected from the group consisting of

(1)

-continued


(2)


(3)


(4)

wherein R^1 is C_1 to C_3 alkyl, and R^2 is methyl or ethyl with an orthoformic acid trialkyl ester in the presence of a catalyst at a temperature of 80° to 165° C., the improvement residing in employing at least 1.6 mols of orthoformic acid ester per mol of said compound and carrying out the process in the presence of a catalyst consisting essentially of an aliphatic carboxylic acid of 2 to 4 carbon atoms and in the absence of a Lewis acid catalyst other than the aliphatic carboxylic acid of 2 to 4 carbon atoms, said carboxylic acid in an amount of up to 50% of the total amount of carboxylic acid to be employed being added to the reaction mixture before commencement of the reaction and the balance of the carboxylic acid being added during the reaction continuously or in several portions, the alcohol being formed being removed during the process.

4,468,354

CONTINUOUS PROCESS FOR PREPARING 5-OXO-2,4-DICHLORO-4-SUBSTITUTED PENTANENITRILES

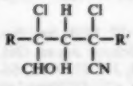
Zenon Lysenko, and Richard G. Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 15, 1983, Ser. No. 466,451

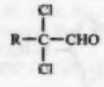
Int. Cl.³ C07C *121/34, 121/76*

U.S. Cl. 260—465.7 **7 Claims**

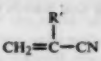
1. A continuous process for making compounds having the formula



where R and R' are individually hydrogen or a straight or branched chain aliphatic radical having 1 to 8 carbon atoms, phenyl, benzyl, cyclohexyl, trichloro or trifluoromethyl which comprises reacting an aldehyde having the formula



where R is as above-defined, with an acrylonitrile compound having the formula



where R' is as defined above in the presence of a transition metal catalyst in a continuous reactor having an interior surface constructed of materials containing no more than a minor percentage of iron.

4,468,355

PROCESS FOR MAKING 1-HYDROXY-ALKANE-1-PHOSPHONIC ACIDS

Werner Krause, Hürth, and Werner Pieper, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 540,191

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238910

Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.4 R **6 Claims**

1. A process for making 1-hydroxyalkane-1-phosphonic acids, which comprises reacting an aldehyde with tetraphosphorus hexoxide (P_4O_6).

4,468,356

DIKETENE CHLORINATION METHOD

Dale E. Van Sickle; Gordon C. Newland; Jeffrey J. Siirola, and Steven L. Cook, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 254,248, Apr. 15, 1981, abandoned. This application Oct. 25, 1982, Ser. No. 436,540

Int. Cl.³ C07C *51/58, 67/46*

U.S. Cl. 260—544 Y **6 Claims**

1. In a process for the continuous chlorination of diketene, the improvement of continuously nebulizing said diketene within a reactor, continously contacting the diketene spray with chlorine gas in a reaction zone consisting essentially of the chlorine gas, diketene and reaction product, at a temperature of from 80° C. to about 210° C., directing the resultant reaction system and product against a condensation surface, and continuously removing liquid product from said reactor.

4,468,357

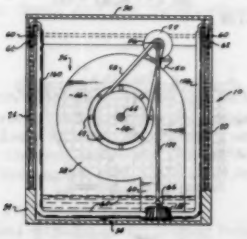
PUMP MEANS AND COUPLING MEANS FOR EVAPORATIVE COOLER

Cecil V. Miller, and Erma M. Miller, both of P.O Box 3646, Riviera, Ariz. 86442

Filed Sep. 13, 1982, Ser. No. 417,138

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—29 **2 Claims**



1. In an evaporative cooler mountable on a structure including four walls of porous material, a bottom pan forming a reservoir for water and a top cover and mounted within said cooler is a centrifugal type fan including a duct communicating with said structure and said fan is adapted to draw air through the porous material and force the same through said duct into said structure, a motor having a single drive shaft projected from one end with a pulley mounted thereon and a drive belt extending to said fan to rotate said fan and a water manifold adjacent said top cover overlying said four walls of porous material and pump means to deliver water from said reservoir to said manifold to dispense water down the porous material, the improvement comprising:

a water pump resting in said reservoir, said pump including water inlet means and at least one said water outlet means including a hose to deliver water to said manifold, impeller means in said pump to draw said water into said pump and vacuum breaking means to assure a free smooth flow of water out said water outlet means;

a flexible drive shaft having one end connected to said motor drive shaft adjacent said pulley and a second end connected to said water pump for direct drive of said pump simultaneously with said fan whereby water in said reservoir is pumped to said manifold; and

a frusto-conical strainer having a plurality of slots spaced therearound to allow water to be drawn therethrough into said pump as well as to prevent introduction of certain foreign matter into said pump.

4,468,358

APPARATUS FOR MIXING AIR AND LIQUID

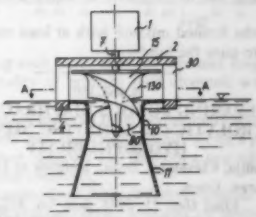
Johny H. Haegeman, 122, Steenweg naar Alsemberg, B-1510 Buizingen, Belgium

Continuation of Ser. No. 278,232, Jun. 29, 1981, abandoned. This application Jan. 7, 1983, Ser. No. 456,452

Claims priority, application Belgium, Jul. 8, 1980, 0/884216

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—91 **3 Claims**



1. An improved aparatus for aeration of a body of liquid such as a body of waste water, said apparatus comprising:

a top-mounted power drive having a rotatable shaft extending downwardly toward the surface of said body of liquid; and

an impeller mounted on said shaft for rotation therewith at the surface level of said body of liquid, said impeller comprising an upwardly, outwardly flared diffusion head forming an impeller body having a lower, axial flow inducing, propeller shaped portion with a blade having a first outer diameter, said blade being mounted on the lower end of said diffusion head for drawing liquid from said body of liquid and pumping said liquid axially upward at a first velocity; said impeller body also having an upper, centrifugal flow inducing portion with a plurality of radially outwardly curved blades having second, outer diameters larger than said first diameter, said blades being mounted on said diffusion head for receiving therebetween said liquid pumped axially upward by said axial flow inducing portion and for centrifugally expelling said liquid outwardly from said impeller at a second velocity greater than said first velocity at a position above the surface of said body of liquid, said blade of said propeller shaped portion being gradually curved into a spiral to merge into and form one of said second plurality of blades, said centrifugal flow inducing portion having an exit

diameter which is greater than that of said propeller shaped portion, whereby said liquid pumped axially upward by said axial flow inducing portion into said centrifugal flow inducing portion is continuously guided and accelerated by said blades as the direction of flow of said liquid changes gradually from axial to centrifugal before being discharged in a nearly horizontal direction from said centrifugal flow inducing portion.

4,468,359

FOUNDRY MOULDS AND CORES

Peter H. R. B. Lemon, Romsey; Jeffrey D. Railton, Southampton; Peter R. Ludlam, North Romsey, and Timothy J. Reynolds, Southampton, all of England, assignors to Borden (UK) Limited, Southampton, England

Filed Nov. 9, 1982, Ser. No. 440,278

Claims priority application United Kingdom, Feb. 9, 1982, 8203686

Int. Cl.[3] **C08K** *3/36, 3/34*

U.S. Cl. 264—82 **14 Claims**

1. A process for the production of foundry moulds or cores which comprises:

mixing a granular refractory material with from 0.5% to 8% based on the weight of the refractory material of a binder solution, said binder solution comprising (i) an aqueous solution of a potassium alkali phenol-formaldehyde resin, said aqueous solution having a solids content of from 50% to 75% and said resin having a weight average molecular weight (M_w) of from 600 to 1500, a formaldehyde:phenol molar ratio of from 1.2:1 to 2.6:1 and a potassium hydroxide:phenol molar ratio of from 0.2:1 to 1.2:1 and (ii) at least one silane in an amount of from 0.05% to 3% based on the weight of said aqueous solution,

discharging the mixture into a vented core or mould box, and

gassing the formed mixture with at least one C_{1-3}alkyl formate to cure the binder.

4,468,360

PREPARING POROUS DIAPHRAGMS FOR ELECTROLYTIC CELLS HAVING NON-UNIFORM HYDROPHOBICITY

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Dec. 21, 1981, Ser. No. 332,424

Int. Cl.[3] **B29C** *25/00;* **B29D** *27/00*

U.S. Cl. 264—83 **3 Claims**

1. A process for producing porous diaphragms for the electrolysis of alkali metal halides comprised of a thermoplastic support fabric impregnated with particles of a siliceous composition having an anode side, a cathode side opposite said anode side and a thickness of at least 0.3 millimeters said process comprising treating said cathode side with an oxidizing agent.

4,468,361

PROCESS FOR IMPARTING SURFACE-STRUCTURES TO WOOD-CEMENT BOARDS

Günter Exner, Dettelbach, and Karlheinz Mönkeberg, Hanover, both of Fed. Rep. of Germany, assignors to Fulgurit GmbH & Co. Kommanditgesellschaft, Wunstorf, Fed. Rep. of Germany

Filed Aug. 18, 1982, Ser. No. 409,141

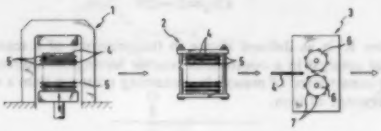
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133836

Int. Cl.[3] **B29J** *5/04*

U.S. Cl. 264—119 **6 Claims**

1. In a process for imparting surface structures to wood-cement boards comprising pressing said boards during the hardening of the cement in a batch press and maintaining said boards in the pressed state in clamping apparatus for a sufficient length of time that said cement has hardened and swelling of the wood fibers no longer is possible, the improvement comprising:

freeing said wood-cement boards from said clamping apparatus while said cement is fresh enough to accept a surface structure and feeding said boards to a calendering system



having two calendering rolls with at least one of said rolls having a surface structure.

4,468,362

METHOD OF PREPARING AN ELECTRODE BACKING LAYER

Frank Solomon, Great Neck, N.Y., assignor to Diamond Shamrock Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 202,575, Oct. 31, 1980, abandoned. This application Dec. 20, 1982, Ser. No. 451,407

Int. Cl.[3] **B27J** *5/00*

U.S. Cl. 264—127 **9 Claims**

1. A method for preparing an electrically conductive, hydrophobic, gas permeable, cohesive, self-sustaining wetproofing sheet for use in forming an oxygen cathode, comprising:

(a) introducing a fine particle sized carbon black into water to form a first dispersion thereof,

(b) introducing polytetrafluoroethylene particles of about 0.05 to 0.5 microns into water containing a wetting agent agent to form a second dispersion thereof,

(c) mixing said first dispersion with said second dispersion to form a third dispersion,

(d) filtering said third dispersion to obtain a wet mass of mixed particles,

(e) heating said wet mass to produce a dried mass containing said carbon black, and polytetrafluoroethylene particles and residual wetting agent,

(f) removing said residual wetting agent from said mass by solvent extraction and/or further heating,

(g) chopping said mass to form it into a granular mix, and

(h) introducing said granular mix between pressing rollers heated to about 65° to 95° C. to form same into said wetproofing sheet.

4,468,363

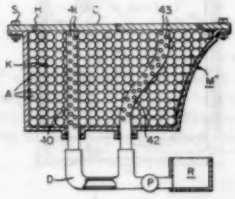
INTERNAL MOLD GATING METHOD AND APPARATUS

James D. Miessler, Springfield, Va., assignor to Versar Inc., Springfield, Va.

Filed Feb. 2, 1983, Ser. No. 463,104

Int. Cl.[3] **B29J** *5/00*

U.S. Cl. 264—128 **19 Claims**



1. A process for the internal gating of molds used to prepare a shaped article comprising a composite of aggregate filler and a curable binder, the process comprising the steps of:

(a) preparing a mold having multiple surfaces enclosing its cavity, and extending gating tube means into the mold

through at least one of its surfaces, the tube means extending through the mold cavity spaced from its surfaces, at least one surface of the mold having breather holes, and the tube means having walls with multiple openings therethrough which are located inside the mold cavity and distributed throughout the length of the tube means therewithin;

(b) filling the cavity of the mold outside of the tube means with aggregate filler packed in close mutual proximity to leave minimum interstitial spaces therebetween;

(c) pumping liquid binder into the tube means to cause it to extrude outwardly into the mold cavity through said wall openings to fill said interstitial spaces along a progressively expanding binder front while expelling air from said breather holes; and

(d) curing the binder after the cavity is filled therewith.

4,468,364

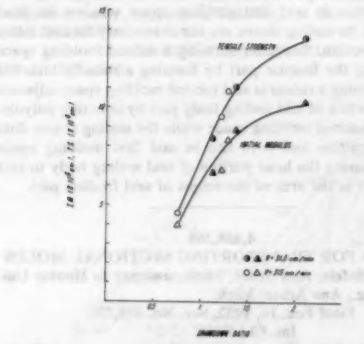
PROCESS FOR EXTRUDING THERMOTROPIC LIQUID CRYSTALLINE POLYMERS

Yoshiaki Ide, North Plainfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,638

Int. Cl.³ B28B *3/20*

U.S. Cl. 264—176 R **17 Claims**



1. A process for extruding a polymer to form shaped articles comprising the steps of:

(a) providing thermotropic liquid crystal polymer in melt form,

(b) extruding said liquid crystal polymer through an extrusion die having a converging entry section and a land length such that the ratio of land length (L) to die orifice diameter (D) is less than 2, and

(c) subjecting the extrudate to a drawdown using a haul-off or take-up device such that the drawdown ratio is less than 4.

4,468,365

EXTRUSION DIES FOR THIN WALL SUBSTRATES

Daniel W. Corbett, Lindley; George M. Cunningham, Horseheads, and Louis S. Socha, Jr., Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,402

Int. Cl.³ B29F *3/04*

U.S. Cl. 264—177 R **9 Claims**

1. A laminated extrusion die for forming honeycomb structures which comprises,

a plurality of die blades positioned adjacent one another in a substantially parallel relationship,

means securing said plurality of substantially parallel die blades together for forming a unitary extrusion die,

said die having an inlet face and an outlet face,

a plurality of primary feed channels between said parallel die blades extending longitudinally inwardly from said inlet face,

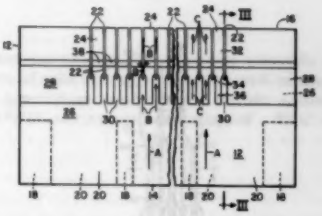
a plurality of interconnected discharge slots formed in said outlet face and extending longitudinally inwardly therefrom,

a flow distribution area between adjacent ones of said die blades and communicating with said primary feed channels and said discharge slots,

deflector means, having secondary feed channels, positioned within said flow distribution areas for deflecting at least a portion of the longitudinal flow of batch material to delivered to the said flow distribution areas by said primary feed channels, transversely of such longitudinal flow, and for filling all of said interconnected discharge slots with batch material so as to discharge a cohesive honeycomb structure from said die,

and said secondary feed channels being formed in said deflector means and communicating at one end adjacent in edge of said deflector means with said primary feed channels and at the other end inwardly of said deflector means with certain of said discharge slots.

9. A method of forming a honeycomb structure from extrudable batch material which comprises,



initially flowing such batch material into and longitudinally along a plurality of primary feed channels within a die structure,

flowing such batch material from said primary feed channels simultaneously into and longitudinally along a plurality of secondary feed channels and through a gap adjacent said secondary feed channels,

dividing the longitudinal flow of batch material from said primary feed channels into a plurality of smaller spaced-apart secondary flows within such secondary feed channels,

deflecting a portion of the longitudinal flow of batch material from said secondary feed channels transversely of such longitudinal flow and filling transversely oriented discharge slots with such flow of batch material while simultaneously filling longitudinally oriented discharge slots with batch material flowing along said gap,

maintaining communication between the flows within said secondary feed channels and the flow through said gap adjacent said channels,

and discharging a cohesive honeycomb structure from said die.

4,468,366

BAFFLED LAMINATED EXTRUSION DIES

Louis S. Socha, Jr., Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,403

Int. Cl.³ B29F *3/04*

U.S. Cl. 264—177 R **13 Claims**

1. A laminated extrusion die for forming honeycomb structures which comprises:

a plurality of die blades, having inlet ends and outlet ends, stacked together to form a laminated extrusion die;

rib means formed on, and spaced apart across the length of, each of the die blades, and extending intermediate said

inlet and outlet ends for forming longitudinally extending feed channels between adjacent die blades;

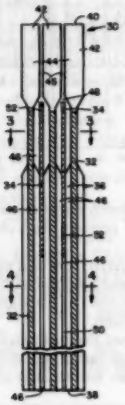
each of said die blades having a plurality of core pins formed in its outlet end and separated by transverse discharge slots, extending inwardly from said outlet end, in communication at end portions thereof with said feed channels;

said core pins formed in adjacent die blades being spaced apart by longitudinal discharge slots, each lying in a plane of lamination between adjacent die blades;

said longitudinal discharge slots effectively forming a continuation of said feed channels, with each longitudinal discharge slot and its associated feed channels lying within a common plane of lamination;

said transverse discharge slots lying within a plurality of planes transverse to said planes of lamination;

and impedance means positioned within said feed channels adjacent inner end portions of, and extending across the length of, said longitudinal discharge slots, for impeding the longitudinal flow of batch material through said longitudinal discharge slots lying within the planes of lamination, and for equalizing flow impedance in the planes of



lamination and the transverse planes so as to fill all of the interconnected discharge slots with batch material and form a cohesive honeycomb structure.

12. A method of forming a honeycomb structure from extrudable batch material which comprises:

initially flowing such batch material into and longitudinally along a plurality of feed channels within a die structure;

flowing such batch material from said feed channels simultaneously into longitudinal discharge slots, formed as extensions of said feed channels, and transverse discharge slots, extending transversely of said feed channels;

positioning baffle means within said feed channels adjacent said discharge slots and along the longitudinal extent of said longitudinal discharge slots;

impeding the flow of batch material into said longitudinal discharge slots by means of said baffle member to equalize flow impedance in longitudinal and transverse discharge slots while simultaneously flowing batch material into said transverse discharge slots;

and discharging a cohesive honeycomb structure from said die.

4,468,367

METHOD OF UNITING A PLASTIC FIXATION PART WITH A SEALING BODY

Joannes H. Beune, Dr Hardenberg, and Warner Uan de Putter, An Hardenberg, both of Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Continuation of Ser. No. 216,964, Dec. 16, 1980, abandoned.
This application Aug. 26, 1983, Ser. No. 526,517
Claims priority, application Netherlands, Dec. 21, 1979, 7909294

Int. Cl.³ B29H 9/00

U.S. Cl. 264—255 1 Claim

1. The method of forming a plastic fixation part attachable to an end portion of a pipe socket part having end corrugations and a sealing body having a head portion and a sealing sleeve comprising the steps of forming a first molding space, firstly molding the sealing body of thermoplastic rubber having resilient properties in said first molding space wherein its head portion and its sealing sleeve are simultaneously formed into a unitary structure, thereafter forming a second molding space and forming the fixation part by forming a radially inturned portion defining a recess in said second molding space adjacent the head portion of said sealing body part by injecting polyolefins in said second molding space while the sealing sleeve does not shift position and is in situ in said first molding space thereby securing the head portion of said sealing body to said fixation part in the area of the recess of said fixation part.

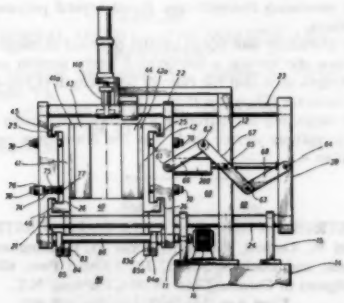
4,468,368

METHOD FOR TRANSPORTING SECTIONAL MOLDS

Robert X. Hafele, Ann Arbor, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Feb. 16, 1982, Ser. No. 348,730
Int. Cl.³ B29C 17/07

U.S. Cl. 264—530 5 Claims



1. A method for transferring articles to be molded in a sealed cavity comprising the steps of:

(a) transporting mold sections along a first essentially linear axis to a first station;

(b) with a power source which is fixed relative to the movement of the mold sections along said first axis, moving the mold sections along a second essentially linear axis which is generally perpendicular to said first axis while at the first station to at least substantially close the molds around

a blank sufficiently to encapsulate the blank in an interior cavity formed by the mold sections;

(c) transporting the blank in the mold cavity to a second station by moving the closed mold sections along said first axis; and

(d) applying force to said mold sections at said second station with said power source to assure an appropriate seal for a molding operation; and

(e) opening said mold sections at said second station with said power source along a third axis which is generally parallel to said second axis.

4,468,369

PROCESS FOR THE VACUUM CALIBRATION OF PROFILED ARTICLES MADE OF THERMOPLASTIC SYNTHETIC RESIN

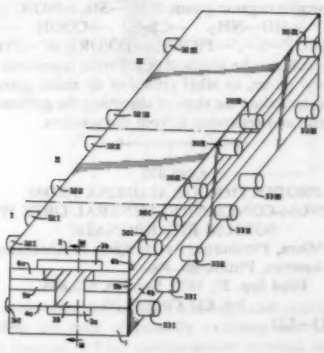
Peter Gauchel, Eitorf-Alzenbach, and Josef Kurth, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 16,171, Feb. 28, 1979, abandoned. This application Mar. 9, 1983, Ser. No. 473,816

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 28093869

Int. Cl.³ B29C *17/00*; B29D *23/00*

U.S. Cl. 264—560 **3 Claims**



1. A process for the liquid cooling and simultaneous calibration of a longitudinal section of a profiled article of thermoplastic synthetic resin which comprises applying a vacuum externally to the entire periphery of the profile surface of a longitudinal section of the profiled article while the article is drawn through a calibrating tool, said calibrating tool having at least one duct for introducing a liquid coolant into said tool and having a plurality of slots extending at right angles to the longitudinal direction of the tool and to the longitudinal section of the profiled article and adjoining the entire periphery of the profile surface of the longitudinal section of the profiled article through which the vacuum is applied to said profile surface via at least one other duct, directing the liquid coolant from the at least one duct into the plurality of slots to cause the liquid coolant to flow transversely along the profile surface to which the vacuum is being applied and then discharging the liquid coolant from the slots and from the calibrating tool via said at least one other duct whereby the profiled article is cooled directly by the flow of the liquid coolant transversely over the profile surface which is under vacuum and which is being calibrated.

4,468,370

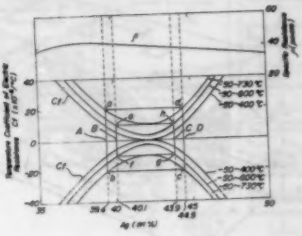
ELECTRICAL RESISTANT ALLOYS HAVING A SMALL TEMPERATURE DEPENDENCE OF ELECTRICAL RESISTANCE OVER A WIDE TEMPERATURE RANGE AND A METHOD OF PRODUCING THE SAME

Hakaru Masumoto, and Naoji Nakamura, both of Sendai, Japan, assignors to The Research Institute of Electric and Magnetic Alloys, Sendai, Japan

Division of Ser. No. 151,712, May 20, 1980, Pat. No. 4,374,679. This application Jul. 12, 1982, Ser. No. 397,226

Int. Cl.³ C22C *5/00*

U.S. Cl. 420—463 **1 Claim**



1. An electrical resistant alloy consisting essentially of 56.1 to 59.9 wt% of palladium and 43.9 to 40.1 wt% of silver, and having a temperature coefficient of electric resistance of $+10\times10^{-6}$/°C. over a temperature range of −50° C. to 600° C.

4,468,371

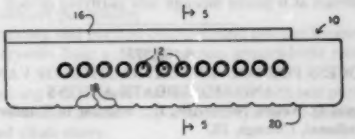
IMMUNOASSAY TEST SLIDE

Anthony B. Chen, Hayward; Richard A. Harte, Redwood City, and Nancy K. Kaufman, Belmont, all of Calif., assignors to Daryl Laboratories, Inc., Santa Clara, Calif.

Filed Jul. 19, 1982, Ser. No. 399,920

Int. Cl.³ G01N *33/54*, *35/00*, *35/02*

U.S. Cl. 422—102 **8 Claims**



1. A test slide for the performance of a series of immunoassay tests comprising

a substantially elongated and thin body of solid material;

a plurality of individual test wells formed in said body,

alignment means formed in said body in association with each of said wells, and

movement facilitating means formed in said body,

said slide being suitable for insertion into an automated testing device, said slide moving by said movement facilitating means, and said wells being aligned for detection by said alignment means.

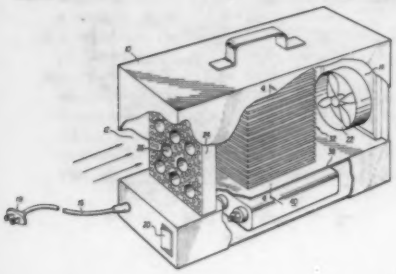
4,468,372
HYGIENIC AIR PURIFYING DEVICE

Reuben E. Seifert, deceased, late of Orlando, Fla. (by Frances Seifert, administratrix), and Jakob Harich, 31 S. Cortez Ave., Winter Springs, Fla. 32803, assignors to Jakob Harich, Winter Springs, Fla.

Continuation-in-part of Ser. No. 132,028, Mar. 20, 1980, abandoned. This application Sep. 30, 1981, Ser. No. 307,142

Int. Cl.³ A61L *9/12, 9/22*

U.S. Cl. 422—124 **5 Claims**



1. A hygienic air purifying device for use in cleaning an air stream contaminated with bacteria, fungi, and/or virus, as well as with other airborne particles, said device comprising:

(a) an enclosure having an air inlet at one end and an air outlet at the other end;

(b) a fan for creating a path for an air stream through said enclosure;

(c) a cartridge mounted in said path and having a plurality of openings therein for allowing passage of the air stream therethrough;

(d) a plurality of pellets carried by said cartridge, said pellets being impregnated with a germicidal agent, said germicidal agent being characterized by both an ability to be siphoned into said air stream and neutralize said bacteria, fungi, and/or viruses and an ability to induce an electrical charge on airborne particles entrained in said air stream; said germicidal agent being the primary source of the electrical charge to said airborne particles;

(e) collecting means positioned downstream from said pellets, said collecting means having an electrical charge applied thereto, opposite in polarity to that induced on said airborne particles by said germicidal agent, for collecting and removing charged airborne particles from said air stream;

whereby bacteria and other germ agents are neutralized by said germicidal agent, and airborne particles are collected from said air stream as it passes through said purifying device.

4,468,373
PROCESS FOR SOLVENT EXTRACTION OF VANADATE AND MOLYBDATE ANIONS

Thomas D. Nevitt, Naperville, Ill., assignor to Standard Oil Co (Indiana), Chicago, Ill.

Filed Aug. 6, 1982, Ser. No. 405,755

Int. Cl.³ C01G *31/00, 39/00*

U.S. Cl. 423—54 **20 Claims**

1. A process for separation of vanadate and molybdate anions, contained in an aqueous solution, from each other which process comprises:

(A) containing said solution with an extractant comprising (1) a quaternary ammonium surfactant compound having at least one long chain cationic group having from about 8 to about 24 carbon atoms, and (2) an organic solvent immiscible in water and wherein the volumetric ratio of extractant to aqueous solution is greater than about 2, at a pH of from about 5 to about 9 to effect the selective extraction of vanadate anions by said extractant; and

(B) partitioning an extractant phase rich in vanadate anions from the aqueous raffinate phase rich in molybdate anions.

4,468,374
METHOD FOR RECOVERY OF GALLIUM

Yushin Kataoka; Masaaki Matsuda, both of Niihama; Hiroshi Yoshitake, Ibaraki, and Yoshikazu Hirose, Toyonaka, all of Japan, assignors to Simitomo Chemical Company, Limited, Osaka, Japan

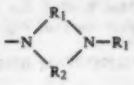
Filed Sep. 10, 1982, Ser. No. 416,692

Claims priority, application Japan, Sep. 17, 1981, 56-147229; Sep. 19, 1981, 56-148444

Int. Cl.³ C01G *15/00*

U.S. Cl. 423—112 **8 Claims**

1. A method for the selective recovery of gallium contained in a solution which comprises contacting a solution containing gallium with a chelate resin having, in the molecule, (A) a =NOH group and (B) a functional group capable of forming a chelate bond with said functional group (A) through gallium or a chelate resin having a metal salt of said functional group, said functional group (B) capable of forming a chelate bond with said functional group (A) through gallium being



wherein R_1 and R_2 which may be identical or different represent hydrogen or organic group, >N, —SH, =NOH, >C=O, —NHOH, —NH—NH_2, —CS_2H, —COOH, —SO_3H, >C=S, CHO, —S—, —$P(OR)_2$, —$PO(OR)_2$ or —$PH(OR)_3$, where R which may be identical or different represents hydrogen, a phenyl group, an alkyl group, or an amino group, said method also including the steps of absorbing the gallium on the chelated resin and removing it from the solution.

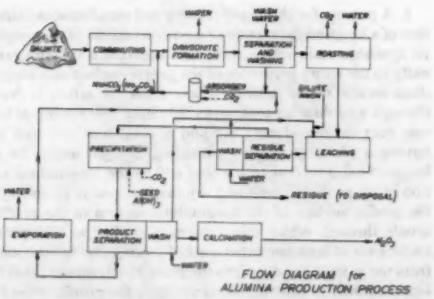
4,468,375
PRODUCTION OF ALUMINA FROM ALUMINUM-CONTAINING MINERAL ORES WITH SODIUM BICARBONATE

Chanakya Misra, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 27, 1982, Ser. No. 423,898

Int. Cl.³ C01F *7/20*

U.S. Cl. 423—122 **20 Claims**



FLOW DIAGRAM for ALUMINA PRODUCTION PROCESS

1. A process for production of alumina from aluminum-containing mineral ore comprising:

(a) comminuting an aluminum-containing mineral ore selected from the group consisting of aluminous clay having an alumina content of about 20 to 40 weight percent, bauxite, kaolinite and metakaolinite;

(b) reacting the comminuted mineral ore at an elevated temperature of about 125° to 300° C. with an aqueous solution containing at least 150 grams per liter of sodium bicarbonate, thereby to form a solid reaction product comprising dawsonite and impurities; and

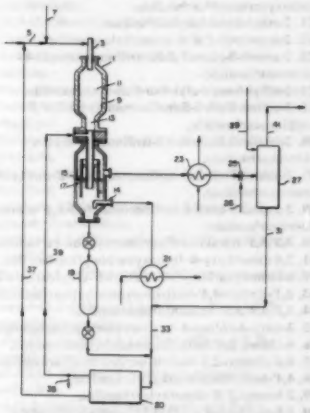
(c) converting the dawsonite to alumina.

4,468,376

DISPOSAL PROCESS FOR HALOGENATED ORGANIC MATERIAL

Robert M. Suggitt, Wappingers Falls, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed May 3, 1982, Ser. No. 374,218
Int. Cl.³ C01B *7/01, 7/08*
U.S. Cl. 423—358 **14 Claims**



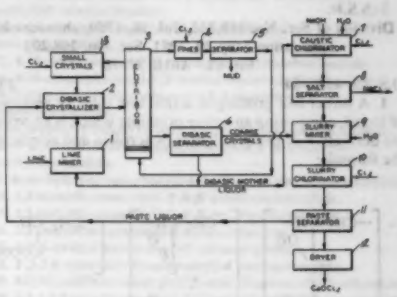
1. A method for disposing of a halogenated organic material comprising the steps of partially oxidizing said halogenated organic material, a hydrocarbonaceous material, and a nitrogen compound with a free oxygen containing gas, and optionally with a temperature moderator, in a synthesis gas generator in the reducing atmosphere of partial oxidation conditions to produce a synthesis gas containing hydrogen halide, ammonia and at least one material selected from the group consisting of hydrogen, carbon monoxide, carbon dioxide, hydrogen cyanide, water, nitrogen, and entrained solids, said synthesis gas containing substantially no halogenated organic material and substantially no free halogen; contacting said synthesis gas with a quench medium containing ammonia to dissolve said hydrogen halide and ammonia into said quench medium; subsequently contacting said halide containing synthesis gas with a scrubbing medium containing ammonia; said quench medium and said scrubbing medium having ammonia dissolved therein in excess of the chemical equivalent amount of hydrogen halide and other acid gases which dissolve into the quench medium and scrubbing medium, said quench medium and said scrubbing medium having a pH between about 4.5 and 6 and remaining at such pH while contacting said hydrogen halide synthesis gas; and disposing of said ammonia neutralized hydrogen halide containing quench medium.

4,468,377

CONTINUOUS PROCESS FOR THE MANUFACTURE OF CALCIUM HYPOCHLORITE

Walter J. Sakowski, Cleveland; Manohar C. Bajaj, Chattanooga, and Budd L. Duncan, Athens, all of Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 7, 1983, Ser. No. 473,167
Int. Cl.³ C01B *11/06*
U.S. Cl. 423—474 **9 Claims**



1. A continuous process for the production of calcium hypochlorite which comprises:

(a) admixing a slurry of lime containing insoluble impurities with a saturated calcium hypochlorite solution in a crystallizing zone to form an impure slurry of coarse dibasic calcium hypochlorite small crystals of dibasic calcium hypochlorite and fine insolubles comprised of unreacted lime particles and fine insolubles in a mother liquor;

(b) feeding said slurry to the intermediate section of a separation zone;

(c) feeding an aqueous sodium chloride elutriant to the lower section of said separation zone to contact said slurry and to separate a slurry of fine insolubles and small crystals of dibasic calcium hypochlorite in said elutriant whereby purified coarse dibasic calcium hypochlorite crystals are obtained;

(d) separating said small crystals of dibasic calcium hypochlorite from said fine insolubles in said intermediate section of the separation zone;

(e) conveying said slurry of fine insolubles in said elutriant to the upper section of said separation zone;

(f) removing a slurry of said purified coarse dibasic calcium hypochlorite crystals in elutriant from said lower section of said separation zone, the rate of removal of said purified coarse crystals of dibasic calcium hypochlorite being controlled to maintain a rising velocity in the lower section of said separation zone of from about 0.5 to about 7 centimeters per minute;

(g) separating said purified coarse dibasic calcium hypochlorite crystals from a dibasic calcium hypochlorite mother liquor;

(h) admixing a chlorinated caustic solution with said purified coarse dibasic calcium hypochlorite cyrstals to produce a mixed alkali slurry;

(i) chlorinating said mixed alkali slurry to form a slurry of calcium hypochlorite dihydrate crystals in a saturated calcium hypochlorite solution;

(j) separating said slurry of calcium hypochlorite dihydrate crystals to provide a cake of calcium hypochlorite dihydrate crystals and a saturated calcium hypochlorite solution;

(k) drying said cake of calcium hypochlorite dihydrate crystals to produce granular calcium hypochlorite; and

(i) recycling said saturated calcium hypochlorite solution to said crystallizing zone.

4,468,378

OXYSULFONIC DERIVATIVE OF COPOLYMER OF ACROLEIN AND ACRYLIC ACID AND DIRECT ACTION ANTICOAGULANT ON ITS BASIS

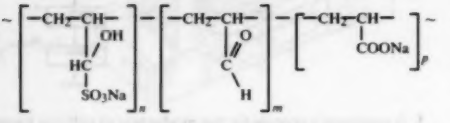
Mikhail G. Voronkov, ulitsa Lermontova, 315, kv. 32; Ada T. Platonova, ulitsa Lermontova, 313, kv. 31; Vladislava Z. Annenkova, ulitsa Marata, 29, kv. 16; Valentina M. Annenkova, ulitsa Lermontova, 289, kv. 43; Valentina B. Kazimirovskaya, ulitsa Lermontova, 289, kv. 56, and Galina S. Ugrjumova, ulitsa Lermontova, 303, kv. 48, all of Irkutsk, U.S.S.R.

Division of Ser. No. 169,242, Jul. 16, 1980, abandoned. This application May 29, 1981, Ser. No. 268,202

Int. Cl.³ A61K *31/78*

U.S. Cl. 424—81 **2 Claims**

1. A direct and prolonged action low toxicity anticoagulant of blood, comprising an active principle which is an oxysulfonate derivative of the copolymer of acrolein and acrylic acid of the formula:



and a liquid carrier for said active principle.

4,468,379

LEUKOCYTE EXTRACTS FOR AFFECTING THE IMMUNE SYSTEM

A. Arthur Gottlieb, New Orleans, La., assignor to Endeavor Corp., New Orleans, La.

Continuation-in-part of Ser. No. 256,886, May 6, 1982, abandoned, which is a continuation-in-part of Ser. No. 149,737, May 14, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,432

Int. Cl.³ A61K *35/14*

U.S. Cl. 424—101 **43 Claims**

1. A process of purifying modulator material from an extract of human leukocytes, and of separating said material from substantially all fluorescamine-reactive material and from L-suppressor, comprising the steps of:

(1) dialyzing said extract through a dialysis membrane having a nominal molecular weight cutoff of about 3500, thereby producing a dialysate;

(2) fractionating said dialysate by gel filtration, thereby producing a plurality of dialysate-fractions;

(3) modulator-assaying said dialysate-fractions, thereby ascertaining modulator activity of said dialysate-fractions;

(4) selecting modulator-assayed dialysate-fractions having substantial modulator activity and pooling them;

(5) applying said selected and pooled modulator-assayed dialysate-fractions to a reverse-phase high pressure liquid chromatography column, packed with octadecyl silane,

(6) eluting said column with an ethanol-in water gradient, thereby producing a plurality of effluent-fractions; and

(7) selecting predetermined effluent-fractions on the basis of ethanol concentration therein, and collecting them.

4,468,380

ANTICOCCIDIAL COMBINATIONS COMPRISING POLYETHER ANTIBIOTICS AND CARBANILIDES

George O. P. O'Doherty, Greenfield, and Albert J. Clinton, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 107,304, Dec. 26, 1979, abandoned. This application May 6, 1981, Ser. No. 260,962

Int. Cl.³ A61K *35/00, 31/35*

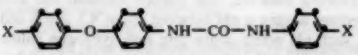
U.S. Cl. 424—114 **52 Claims**

1. A process for controlling coccidiosis in poultry which comprises orally administering to the poultry a feedstuff comprising a first component which is a polyether antibiotic and a second component which is a carbanilide, said components being present in the feedstuff in concentrations which, in combination, exert a potentiated or synergized anticoccidial effect as to at least one coccidiosis-causing strain of Eimeria, and said carbanilide being selected from the group consisting of

A.1. 3,3'-bis(trifluoromethyl)-4,4'-dichlorocarbanilide,
A.2. 3,3',5,5'-tetrakis(trifluoromethyl)carbanilide,
A.3. 3-chloro-4'-fluorocarbanilide,
A.4. 2-chloro-2'-fluorocarbanilide,
A.5. 3,4',5-tris(trifluoromethyl)carbanilide,
A.6. 3,4,5-trichlorocarbanilide,
A.7. 2-chloro-5-(trifluoromethyl)-4'-(ethoxycarbonyl)carbanilide,
A.8. 2,6-dimethyl-4'-(N—methylacetamido)carbanilide,
A.9. 2-methoxy-4'-acetamidocarbanilide,
A.10. 3-(trifluoromethyl)-4'-iodothiocarbanilide,
A.12. 2-methoxy-4'-isopropylcarbanilide,
A.13. 2-methyl-2',5'-diethoxycarbanilide,
A.14. 4-ethyl-2'-methoxycarbanilide,
A.16. 2,4,4'-trimethyl-3'-nitrocarbanilide,
A.17. 2-amino-3-nitro-5-(trifluoromethyl)-2',4'-dimethylcarbanilide,
A.18. 2-amino-3,4'-dinitro-5-(trifluoromethyl)-2'-chlorocarbanilide,
A.19. 2-amino-3,5'-dinitro-5-(trifluoromethyl)-2'-fluorocarbanilide,
A.20. 2-amino-3-nitro-5-(trifluoromethyl)-2'-(ethoxycarbonyl)carbanilide,
A.21. 2-ethyl-6-sec-butylcarbanilide,
A.22. 2-isopropyl-2',4',6'-trimethylcarbanilide,
A.23. 2-amino-3-nitro-3',5-bis(trifluoromethyl)-4'-chlorocarbanilide,
A.24. 2-ethyl-6-sec-butyl-4'-n-butoxycarbanilide,
A.25. 2-amino-3-nitro-5-(trifluoromethyl)-2',4',5'-trichlorocarbanilide,
A.26. 2-amino-3,3'-dinitro-5-(trifluoromethyl)-4'-chlorocarbanilide,
A.27. 2-amino-3-nitro-5-(trifluoromethyl)-2'-methyl-4'-bromocarbanilide,
A.28. 2-amino-3-nitro-5-(trifluoromethyl)-2',6'-dibromo-4'-fluorocarbanilide,
A.30. 3,3',5,5'-tetrakis(trifluoromethyl)thiocarbanilide,
A.31. 2,4-dimethoxy-4'-(ethoxycarbonyl)carbanilide,
A.32. 4-(ethoxycarbonyl)-2'-methyl-6'-ethylcarbanilide,
A.33. 2,2'-dinitro-4,4'-bis(trifluoromethyl)carbanilide,
A.34. 3,3',4,4',5,5'-hexachlorocarbanilide,
A.35. 3-nitro-4-chloro-4'-(trifluoromethyl)carbanilide,
A.36. 4-chloro-3,4'-bis(trifluoromethyl)carbanilide,
A.37. 4,4'-dinitro-2,2'-bis(trifluoromethyl)carbanilide,
A.38. 4,4'-bis(trifluoromethyl)carbanilide,
A.39. 3-bromo-3',5'-dimethylcarbanilide,
A.40. 2,5-dichloro-4'-methyl-N^2—ethylcarbanilide,
A.41. 2,5-dichloro-2',4'-difluorocarbanilide,
A.43. 2,6-diethyl-4'-(ethoxycarbonyl)carbanilide,
A.44. 3-ethyl-3'-chloro-4'-methyl-N^2—ethylcarbanilide,
A.45. 2,6-dimethyl-4'-(ethoxycarbonyl)carbanilide,
A.46. 4-methoxy-3'-acetamidocarbanilide,
A.47. 2-methoxy-4'-(n-butoxycarbonyl)carbanilide,
A.48. 4-(isobutoxycarbonyl)carbanilide,
A.49. 2,4'-bis(methoxycarbonyl)carbanilide,
A.50. 2',4-dichloro-3-nitro-3'-(trifluoromethyl)carbanilide,
A.51. 3,4,4',5-tetrachloro-3'-(trifluoromethyl)carbanilide,
A.52. 4-chloro-3-nitro-3',5'-bis(trifluoromethyl)carbanilide,
A.53. 2,4,6-trimethyl-4'-(ethoxycarbonyl)carbanilide,
A.54. 2-(trifluoromethyl)-2'-ethyl-6'-isopropylcarbanilide,
A.55. 4-chloro-3,3',5'-tris(trifluoromethyl)carbanilide,
A.56. 3,4,4',5-tetrachloro-3'-nitrocarbanilide,
A.57. 2,6-dimethyl-4'-benzoylcarbanilide,
A.58. 3,4-dimethyl-2'-ethoxycarbanilide,
A.59. 2-chloro-4,4'-bis(methylthio)carbanilide,
A.63. 4-(trifluoromethyl)-4'-nitrocarbanilide, and
A.64. 3,3',5,5'-tetrakis(trifluoromethyl)-N,N'—dimethylcarbanilide.

B. A compound of the formula

Formula I



wherein each X is independently selected from the group consisting of chlorine, bromine, and nitro radicals; or a

compound of the same formula as (I) except that a hydrogen of at least one of the rings of (I) is replaced by a substituent selected from the group consisting of chlorine, bromine, nitro and lower alkyl radicals; or

C. A compound selected from the group consisting of

C.1. 3,3',5'-tris(trifluoromethyl)-4-methoxycarbanilide,
C.2. 3-(trifluoromethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.3. 4-(trifluoromethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.4. 2,3',5'-tris(trifluoromethyl)-4-(trifluoromethoxy)carbanilide,
C.5. 4-(methylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.7. 3-chloro-4-(methylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.8. 3-(trifluoromethylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.9. 4-(trifluoromethylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.10. 2-chloro-4-(trifluoromethylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.11. 4-(trifluoromethylthio)-3'-(trifluoromethyl)-5'-nitrocarbanilide,
C.12. 4-(trifluoromethylthio)-2',5'-bis(trifluoromethyl)-4'-nitrocarbanilide,
C.13. 4,4'-bis(trifluoromethyl)thiocarbanilide,
C.14. 4-(trifluoromethylthio)-4'-(chloromethylsulfonyl)carbanilide,
C.15. 3-(difluoromethylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.16. 4-(ethylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.17. 3-chloro-4-(ethylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.18. 4-ethoxy-3,3',5'-tris(trifluoromethyl)carbanilide
C.19. 3-(trifluoromethyl)-4-ethoxy-4'-(trifluoromethylthio)carbanilide,
C.20. 3-(trifluoromethyl)-4-ethoxy-3'-(trifluoromethylthio)carbanilide,
C.21. 4-methyl-3-(2-chloroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.22. 4-(1,2-dichlorovinyloxy)-3'-(trifluoromethyl)-4'-chlorocarbanilide,
C.23. 4-(1,2-dichlorovinyloxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.24. 4-(2,2,2-trichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.25. 2-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.26. 3-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.27. 3-(2,2-dichloro-1,1-difluoroethoxy)-4-bromo-3',5'-bis(trifluoromethyl)carbanilide,
C.28. 4-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.29. 4-(2,2-dichloro-1,1-difluoroethoxy)-3'-(trifluoromethyl)-4'-chlorocarbanilide,
C.30. 3-methoxy-4-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.31. 3-methyl-4-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.32. 3-methyl-4-(2,2-dichloro-1,1-difluoroethoxy)-4'-isopropylcarbanilide,
C.33. 3-nitro-4-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.34. 2-(2-chloro-1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.35. 4-(2,2-dichloro-1,1-difluoroethoxy)-3,3',5'-tris(trifluoromethyl)carbanilide,
C.36. 3-(2-chloro-1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.37. 4-(2-chloro-1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.38. 4-(2-chloro-1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)thiocarbanilide,
C.39. 4-(2-chloro-1,1,2-trifluoroethoxy)-3'-(trifluoromethyl)-5'-nitrocarbanilide,
C.40. 4,4'-bis(2-chloro-1,1,2-trifluoroethoxy)carbanilide,
C.41. 4-(2-chloro-1,1,2-trifluoroethoxy)-4'-(trifluoromethylthio)carbanilide,
C.42. 4-(2-chloro-1,1,2-trifluoroethoxy)-3'-(trifluoromethyl)-4'-chlorocarbanilide,
C.43. 4-(2-chloro-1,1,2-(trifluoroethoxy)-3,3'-bis(trifluoromethyl)-5'-nitrocarbanilide,
C.44. 4-(2-chloro-1,1,2-trifluoroethoxy)-3,3',5'-tris(trifluoromethyl)carbanilide,
C.45. 3-(1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.46. 3-(1,1,2,2-tetrafluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.47. 3-methyl-4-(1,1,2,2-tetrafluoroethoxy)-3'-(chlorodifluoromethyl)carbanilide,
C.48. 3-methyl-4-(1,1,2,2-tetrafluoroethoxy)-3'-(trifluoromethyl)-4'-chlorocarbanilide,
C.49. 3-(trifluoromethyl)-4-(1,1,2,2-tetrafluoroethoxy)-4'-bromocarbanilide,
C.50. 3-(1,1,2,2,3,3-hexafluoro-n-propoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.51. 4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.52. 3-chloro-4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.53. 3-methyl-4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.54. 4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3,3',5'-tris(trifluoromethyl)carbanilide,
C.55. 4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3,3'-bis(trifluoromethyl)-5'-nitrocarbanilide,
C.56. 4-(methoxycarbonylthio)-3',5'-bis(trifluoromethyl)carbanilide,
C.57. 4-(4-chlorophenoxy)-4'-(trifluoromethylthio)carbanilide,
C.58. 4-(4-chlorophenoxy)-3',5'-bis(trifluoromethyl)carbanilide,
C.59. 3-chloro-4-(4-chlorophenoxy)-3',5'bis(trifluoromethyl)carbanilide,
C60. 4-(4-chlorophenoxy)-3'-(trifluoromethyl)-5'-nitrocarbanilide,
C.61. 4-(3,5-bis(trifluoromethyl)phenoxy)-3',5'bis(trifluoromethyl)carbanilide,
C63. 4-methylphenoxycarbonyl)-4'-(trifluoromethylthio)carbanilide,
C.64. 3,5-bis(trifluoromethyl)-2',4',6'-trichlorocarbanilide,
C.65. 3,5-bis(trifluoromethyl)-2',4',5'-trichlorocarbanilide,
C.66. 3,3'-bis(trifluoromethyl)-5'-nitrocarbanilide,
C.67. 3,3',5-tris(trifluoromethyl)-5'-nitrocarbanilide,
C.68. 2',3,5,6'-tetrakis(trifluoromethyl)-4'-nitrocarbanilide,
C.69. 4-(chlorodifluoromethyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.70. 3-1,1,2,2-tetrafluoroethyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.71. 4-phenyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.72. 3-(fluorosulfonyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.73. 4-(fluorosulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.74. 4-(fluorosulfonyl)-3'-(trifluoromethyl)-5'-nitrocarbanilide,
C.75. 4-(chloromethylsulfonyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.76. 2-(ethylsulfonyl)-3',5,5'-tris(trifluoromethyl)carbanilide,
C.77. 2-(ethylsulfonyl)-3',5-bis(trifluoromethyl)-5'-nitrocarbanilide,
C.78. 4-(trifluoromethylsulfonyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.79. 4-(trifluoromethylsulfonyl)-3'1-(trifluoromethyl)-4'-methoxycarbanilide,
C.80. 4-(trifluoromethylsulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.81. 4-(4-nitrophenylsulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.82. 4-(4(acetamidophenylsulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.83. 4-(4-(isopropylideneamino)phenylsulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.84. 4,4-sulfonylbis(3'-(trifluoromethylthio)carbanilide,
C.85. 4,4-sulfonylbis(4'-(1,2-dichlorovinyloxy)carbanilide),
C.86. 4,4-sulfonylbis(3'-(1,1,2,2-tetrafluoroethoxy)carbanilide),
C.87. 4,4-sulfonylbis(4'-(2-chloro-1,1,2-trifluoroethoxy)carbanilide), and
C.88. 4,4-sulfonylbis(4'-(trifluoromethylthio)carbanilide).

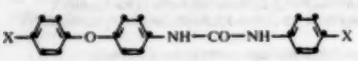
27. A poultry feedstuff composition comprising a first component which is a polyether antibiotic and a second component which is a carbanilide, said components being present in concentrations which, in combination, exert a potentiated or synergized anticoccidial effect as to at least one coccidiosis-causing strain of Eimeria, and said carbanilide being selected from the group consisting of

A.1. 3,3'-bis(trifluoromethyl)-4,4'-dichlorocarbanilide,
A.2. 3,3',5,5'-tetrakis(trifluoromethyl)carbanilide,
A.3. 3-chloro-4'-fluorocarbanilide,
A.4. 2-chloro-2'-fluorocarbanilide,
A.5. 3,4',5-tris(trifluoromethyl)carbanilide,
A.6. 3,4,5-trichlorocarbanilide,
A.7. 2-chloro-5-(trifluoromethyl)-4'-(ethoxycarbonyl)carbanilide,
A.8. 2,6-dimethyl-4'-(N—methylacetamido)carbanilide,
A.9. 2-methoxy-4'-acetamidocarbanilide,
A.10. 3-(trifluoromethyl)-4'-iodothiocarbanilide,
A.12. 2-methoxy-4'-isopropylcarbanilide,
A.13. 2-methyl-2',5'-diethoxycarbanilide,
A.14. 4-ethyl-2'-methoxycarbanilide,
A.16. 2,4,4'-trimethyl-3'-nitrocarbanilide,
A.17. 2-amino-3-nitro-5-(trifluoromethyl)-2',4'-dimethylcarbanilide,
A.18. 2-amino-3,4'-dinitro-5-(trifluoromethyl)-2'-chlorocarbanilide,
A.19. 2-amino-3,5'-dinitro-5-(trifluoromethyl)-2'-fluorocarbanilide,
A.20. 2-amino-3-nitro-5-(trifluoromethyl)-2'-(ethoxycarbonyl)carbanilide,
A.21. 2-ethyl-6-sec-butylcarbanilide,
A.22. 2-isopropyl-2',4',6'-trimethylcarbanilide,

-continued

A.23. 2-amino-3-nitro-3',5-bis(trifluoromethyl)-4'-chlorocarbanilide.
A.24. 2-ethyl-6-sec-butyl-4'-n-butoxycarbanilide.
A.25. 2-amino-3-nitro-5-(trifluoromethyl)-2',4',5'-trichlorocarbanilide.
A.26. 2-amino-3,3'-dinitro-5-(trifluoromethyl)-4'-chlorocarbanilide.
A.27. 2-amino-3-nitro-5-(trifluoromethyl)-2'-methyl-4'-bromocarbanilide.
A.28. 2-amino-3-nitro-5-(trifluoromethyl)-2',6'-dibromo-4'-fluorocarbanilide.
A.30. 3,3',5,5'-tetrakis(trifluoromethyl)thiocarbanilide.
A.31. 2,4-dimethoxy-4'-(ethoxycarbonyl)carbanilide.
A.32. 4-(ethoxycarbonyl)-2'-methyl-6'-ethylcarbanilide.
A.33. 2,2'-dinitro-4,4'-bis(trifluoromethyl)carbanilide.
A.34. 3,3',4,4',5,5'-hexachlorocarbanilide.
A.35. 3-nitro-4-chloro-4'-(trifluoromethyl)carbanilide.
A.36. 4-chloro-3,4'-bis(trifluoromethyl)carbanilide.
A.37. 4,4'-dinitro-2,2'-bis(trifluoromethyl)carbanilide.
A.38. 4,4'-bis(trifluoromethyl)carbanilide.
A.39. 3-bromo-3',5'-dimethylcarbanilide.
A.40. 2,5-dichloro-4'-methyl-N^2-ethylcarbanilide.
A.41. 2,5-dichloro-2',4'-difluorocarbanilide.
A.43. 2,6-diethyl-4'-(ethoxycarbonyl)carbanilide.
A.44. 3-ethyl-3'-chloro-4'-methyl-N^2—ethylcarbanilide.
A.45. 2,6-dimethyl-4'-(ethoxycarbonyl)carbanilide.
A.46. 4-methoxy-3'-acetamidocarbanilide.
A.47. 2-methoxy-4'-(n-butoxycarbonyl)carbanilide.
A.48. 4-(isobutoxycarbonyl)carbanilide.
A.49. 2,4'-bis(methoxycarbonyl)carbanilide.
A.50. 2',4'-dichloro-3-nitro-3'-(trifluoromethyl)carbanilide.
A.51. 3,4,4',5-tetrachloro-3'-(trifluoromethyl)carbanilide.
A.52. 4-chloro-3-nitro-3',5'-bis(trifluoromethyl)carbanilide.
A.53. 2,4,6-trimethyl-4'-(ethoxycarbonyl)carbanilide.
A.54. 2-(trifluoromethyl)-2'-ethyl-6'-isopropylcarbanilide.
A.55. 4-chloro-3,3',5'-tris(trifluoromethyl)carbanilide.
A.56. 3,4,4',5-tetrachloro-3'-nitrocarbanilide.
A.57. 2,6-dimethyl-4'-benzoylcarbanilide.
A.58. 3,4-dimethyl-2'-ethoxycarbanilide.
A.59. 2-chloro-4,4'-bis(methylthio)carbanilide.
A.63. 4-(trifluoromethyl)-4'-nitrocarbanilide, and
A.64. 3,3',5,5'-tetrakis(trifluoromethyl)-N,N'-dimethylcarbanilide.

B. A compound of the formula



Formula I

wherein each X is independently selected from the group consisting of chlorine, bromine, and nitro radicals; or a compound of the same formula as (I) except that a hydrogen of at least one of the rings of (I) is replaced by a substituent selected from the group consisting of chlorine, bromine, nitro and lower alkyl radicals; or

C. A compound selected from the group consisting of
C.1. 3,3',5'-tris(trifluoromethyl)-4-methoxycarbanilide.
C.2. 3(5)-(trifluoromethoxy)-3',5'-bis(trifluoromethyloxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.3. 4-(trifluoromethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C4. 2,3',5'-tris(trifluoromethyl)-4-(trifluoromethoxy)carbanilide.
C5. 4-(methylthio)-3',5'-bis(trifluoromethyl)carbanilide.
C.7. 3-chloro-4-(methylthio)-3',5'-bis(trifluoromethyl)carbanilide.
C.8. 3-(trifluoromethylthio)-3',5'-bis(trifluoromethyl)carbanilide.
C.9. 4-(trifluoromethylthio)-3',5'-bis(trifluoromethyl)carbanilide.
C.10. 2-chloro-4-(trifluoromethylthio)-(8)3',5'-bis(trifluoromethyl)carbanilide.
C.11. 4-(trifluoromethylthio)-3'-(trifluoromethyl)-5'-nitrocarbanilide.
C12. 4-(trifluoromethylthio)-2',5'-bis(trifluoromethyl)-4'-nitrocarbanilide.
C.13. 4,4'-bis(trifluoromethylthio)carbanilide.
C.14. 4-(trifluoromethylthio)-4'-(chloromethylsulfonyl)carbanilide.
C.15. 3-(difluoromethylthio)-3',5'-bis(trifluoromethyl)carbanilide.
C.16. 4-(ethylthio)-3',5'-bis(trifluoromethyl)carbanilide.
C.17. 3-chloro-4-(ethylthio)-3',5'-bis(trifluoromethyl)carbanilide.
C.18. 4-ethoxy-3,3',5'-tris(trifluoromethyl)carbanilide.
C.19. 3-(trifluoromethyl)-4-ethoxy-4'-(trifluoromethylthio)carbanilide.
C.20. 3-(trifluoromethyl)-4-ethoxy-3'-(trifluoromethylthio)carbanilide.
C.21. 4-methyl-3-(2-chloroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.22. 4-(1,2-dichlorovinyloxy)-3'-(trifluoromethyl)-4'-chlorocarbanilide.
C.23. 4-(1,2-dichlorovinyloxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.24. 4-(2,2,2-trichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.25. 2-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.26. 3-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.27. 3-(2,2-dichloro-1,1-difluoroethoxy)-4-bromo-3',5'-bis(trifluoromethyl)carbanilide.
C.28. 4-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.29. 4-(2,2-dichloro-1,1-difluoroethoxy)-3'-(trifluoromethyl)-4'-chlorocarbanilide.
C.30. 3-methoxy-4-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.31. 3-methyl-4-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.32. 3-methyl-4-(2,2-dichloro-1,1-difluoroethoxy)-4'-isopropylcarbanilide.
C.33. 3-nitro-4-(2,2-dichloro-1,1-difluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.34. 2-(2-chloro-1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.35. 4-(2,2-dichloro-1,1-difluoroethoxy)-3,3',5'-tris(trifluoromethyl)carbanilide.
C.36. 3-(2-chloro-1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.37. 4-(2-chloro-1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.38. 4-(2-chloro-1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)thiocarbanilide.
C.39. 4-(2-chloro-1,1,2-trifluoroethoxy)-3'-(trifluoromethyl)-5'-nitrocarbanilide.
C.40. 4,4'-bis(2-chloro-1,1,2-trifluoroethoxy)carbanilide.
C.41. 4-(2-chloro-1,1,2-trifluoroethoxy)-4'-(trifluoromethylthio)carbanilide.
C.42. 4-(2-chloro-1,1,2-trifluoroethoxy)-3'-(trifluoromethyl)-4'-chlorocarbanilide.
C.43. 4-(2-chloro-1,1,2-trifluoroethoxy)-3,3'-bis(trifluoromethyl)-5'-nitrocarbanilide.
C.44. 4-(2-chloro-1,1,2-trifluoroethoxy)-3,3',5'-tris(trifluoromethyl)carbanilide.
C.45. 3-(1,1,2-trifluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.46. 3-(1,1,2,2-tetrafluoroethoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.47. 3-methyl-4-(1,1,2,2-tetrafluoroethoxy)-3'-(chlorodifluoromethyl)carbanilide.
C.48. 3-methyl-4-(1,1,2,2-tetrafluoroethoxy)-3'-(trifluoromethyl)-4'-chlorocarbanilide.
C.49. 3-(trifluoromethyl)-4-(1,1,2,2-tetrafluoroethoxy)-4'-bromocarbanilide.
C.50. 3-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.51. 4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.52. 3-chloro-4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3',5'-bis(fluoromethyl)carbanilide.
C.53. 3-methyl-4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.54. 4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3,3',5'-tris(trifluoromethyl)carbanilide.
C.55. 4-(1,1,2,3,3,3-hexafluoro-n-propoxy)-3,3'-bis(trifluoromethyl)-5'-nitrocarbanilide.
C.56. 4-(methoxycarbonylthio)-3',5'-bis(trifluoromethyl)carbanilide.
C.57. 4-(4-chlorophenoxy)-4'-(trifluoromethylthio)thiocarbanilide.
C.58. 4-(4-chlorophenoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.59. 3-chloro-4-(4-chlorophenoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.60. 4-(4-chlorophenoxy)-3'-(trifluoromethyl)-5'-nitrocarbanilide.
C.61. 4-(3,5-bis(trifluoromethyl)phenoxy)-3',5'-bis(trifluoromethyl)carbanilide.
C.62. 4-(4-methylphenoxycarbonyl)-3',5'-bis(trifluoromethyl)carbanilide
C.63. 4-(4-methylphenoxycarbonyl)-4'-(trifluoromethylthio)carbanilide.
C.64. 3,5-bis(trifluoromethyl)-2',4',6'-trichlorocarbanilide.
C.65. 3,5-bis(trifluoromethyl)-2',4',5'-trichlorocarbanilide.

-continued

C.66. 3,3'-bis(trifluoromethyl)-5'-nitrocarbanilide,
C.67. 3,3',5-tris(trifluoromethyl)-5'-nitrocarbanilide,
C.68. 2',3,5,6'-tetrakis(trifluoromethyl)-4'-nitrocarbanilide,
C.69. 3-(chlorodifluoromethyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.70. 3-(1,1,2,2-tetrafluoroethyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.71. 4-phenyl-3',5'-bis(trifluoromethyl)carbanilide,
C.72. 3-(fluorosulfonyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.73. 4-(fluorosulfonyl)-4'-(trifluoromeethylthio)carbanilide,
C.74. 4-(fluorosulfonyl)-3'-(trifluoromethyl)-5'-nitrocarbanilide,
C.75. 4-(chloromethylsulfonyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.76. 2-(ethylsulfonyl)-3',5,5'-tris(trifluoromethyl)carbanilide,
C.77. 2-(ethylsulfonyl)-3',5-bis(trifluoromethyl)-5'-nitrocarbanilide,
C.78. 4-(trifluoromethylsulfonyl)-3',5'-bis(trifluoromethyl)carbanilide,
C.79. 4-(trifluoromethylsulfonyl)-3'-(trifluoromethyl)-4'-methoxycarbanilide,
C.80. 4-(trifluoromethylsulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.81. 4-(4-nitrophenylsulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.82. 4-(4-acetamidophenylsulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.83. 4-(4-(isopropylideneamino)phenylsulfonyl)-4'-(trifluoromethylthio)carbanilide,
C.84 4,4-sulfonylbis(3'-(trifluoromethylthio)carbanilide),
C.85. 4,4-sulfonylbis(4'-(1,2-dichlorovinyloxy)carbanilide),
C.86. 4,4-sulfonylbis(3'-(1,1,2,2-tetrafluoroethoxy)carbanilide),
C.87. 4,4-sulfonylbis(4'-(2-chloro-1,1,2-trifluoroethoxy)carbanilide, and
C.88. 4,4-sulfonylbis(4'-(trifluoromethylthio)carbanilide)

4,468,381
CONCENTRATED MAGNESIUM HYDROXIDE PREPARATIONS

Arun K. Mitra, and Robert G. Flynn, both of St. Louis, Mo., assignors to Norcliff Thayer, Inc., Tarrytown, N.Y.

Continuation-in-part of Ser. No. 259,712, May 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 872,995, Jan. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 724,454, Sep. 17, 1976, abandoned. This application Jun. 3, 1983, Ser. No. 500,730

Int. Cl.³ A61K *33/08*

U.S. Cl. 424—158 **22 Claims**

1. A stable aqueous thixotropic composition for the oral administration of magnesium hydroxide, said composition having a viscosity immediately after manufacture of about 25 to 150 CPS as measured by a Brookfield-LVT viscometer with a No. 2 Spindle run at 30 RPM, and a yield value 24 hours after manufacture of about 5 to 14 as measured by a Haake Rotovisco R VIII viscometer at room temperature at 4 RPM with a 50 gram measuring head comprising:

(a)	magnesium hydroxide	16-24% w/v
(b)	a water-soluble, pharmaceutically acceptable stabilizing or thixotropy producing agent selected from the group of polycarboxylic acids consisting of citric, tartaric, succinic, adipic, malic and fumaric acids	0.05 to 0.8% w/v
(c)	a water-soluble, pharmaceutically acceptable thinning or fluidizing agent selected from the group consisting of alkali and ammonium salts of phosphoric acids and pharmaceutically acceptable salts of polycarboxylic acids selected from the group consisting of citric, tartaric, succinic, adipic, malic, and fumaric acids, and mixtures of said salts	0.05 to 1.8 w/v
(d)	a water-soluble, pharmaceutically acceptable anionic polymer selected from the group consisting of sodium carboxymethylcellulose, alginic acid derivatives and carrageenin	0.08 to 1.2 w/v
(e)	sucrose	6 to 10 w/v
(f)	water	q.s 100 v.

4,468,382
POLYPEPTIDE-TOXIN HYBRID PROTEIN

Patricia Bacha, Brookline; Seymour Reichlin, Weston, and John R. Murphy, Roslindale, all of Mass., assignors to New England Medical Center, Inc., Boston, Mass.

Filed Jul. 15, 1982, Ser. No. 398,677

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **6 Claims**

1. A hybrid protein comprising TRH covalently bonded through a disulfide linkage to CRM 45.

4,468,383
DIMERIC ENKEPHALINS

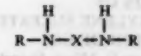
David Rodbard, Bethesda; Y. Shimohigashi, Rockville; Hao-Chia Chen, Gaithersburg, all of Md., and Tommaso Costa, Munich, Fed. Rep. of Germany, assignors to The United States of America as represented by the Secretary of the Department of Health and Human Service, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 427,857

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **20 Claims**

1. A symmetrical dimeric enkephalin polypeptide capable of binding to neural opiate receptors of the formula



wherein:

X is a divalent 2,7-fluorene radical, C_1–C_{22}-alkylene, or a direct bond;

R is H-Tyr-D-Ala-Gly-Phe-Leu; H-Tyr-D-Ala-Bly-Phe; H-Tyr-D-Ala-Gly, or Phe-Leu; and

the R groups are the same.

4,468,384

METHOD FOR THE INHIBITION OF THE REPLICATION OF DNA VIRUSES WITH 5-SUBSTITUTED 2-PYRIMIDINONE NUCLEOSIDES

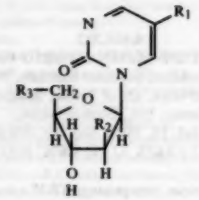
Thomas J. Bardos, Snyder, N.Y.; Yung-Chi Cheng, Chapel Hill, N.C., and Alan C. Schroeder, Buffalo, N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Jan. 5, 1982, Ser. No. 337,297

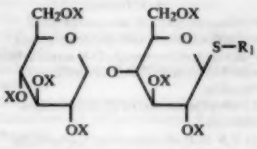
Int. Cl.³ A61K *31/70, 39/245*

U.S. Cl. 424—180 **9 Claims**

1. A method for inhibiting the replication of a DNA virus which induces formation of thymidine kinase enzyme, by exposing a susceptible DNA virus to an effective concentration of a compound of the formula:

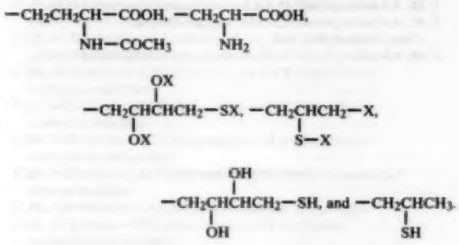


wherein R_1 is a radical selected from the group consisting of halogen, $—SCH_3$, —OH, alkoxy, cyano, methylamino, carboxy, formyl, nitro and unsubstituted or halosubstituted hydrocarbon groups of 1 through 3 carbon atoms; R_2 is hydrogen; halogen or hydroxy; and R_3 is hydroxy, $—OP(O)(OH)_2$, amino, or $—OOR_4$ where R_4 is lower alkyl of 1 through 6 carbon atoms.



(= α or β)

wherein X is $—SO_3M$ and M is a nontoxic pharmaceutically acceptable cation salt, wherein the salt forming moiety is selected from the group consisting of alkali metal, alkaline earth metal, aluminum, ammonia, zinc and substituted ammonia selected from the group consisting of trialkylamine (C_1–C_6), piperidine, pyrazine, alkanolamine (C_2–C_6) and cycloalkylamine (C_3–C_6); and R_1 is selected from the group consisting of



4,468,385

POLY-CATION SALTS OF 4-O-POLY-HEXAOSE-THIO-ALKYLENE SULFATE DERIVATIVES AND METHOD OF USE

Francis M. Callahan, Stony Point; Thomas G. Miner, Sugarloaf, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 29, 1983, Ser. No. 527,582

Int. Cl.³ C07H *15/02;* **A61K** *31/70*

U.S. Cl. 424—180 **19 Claims**

19. A method of modulating the complement system in a warm-blooded animal which comprises administering to said animal an effective complement modulating amount of a pharmaceutically acceptable compound selected from those of the formula:

4,468,386

1-DEAMINO-1-HYDROXY-AMINOGLYCOSIDE COMPOUNDS, ANTIBACTERIAL COMPOSITIONS AND METHOD OF USE

Minoru Hanada, Tokyo; Mitsuaki Tsunakawa, both of Tokyo; Koji Tomita, Kawasaki; Hiroshi Tsukiura, Sendai, and Hiroshi Kawaguchi, Tokyo, all of, assignors to Bristol-Myers Company, New York, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,740

Int. Cl.³ A61K *31/71;* **C12P** *19/50, 19/52;* **C07H** *15/22*

U.S. Cl. 424—181 **8 Claims**

1. Antibiotic Bu-2659 complex comprising a mixture of 1-deamino-1-hydroxyneomycin B, 1-deamino-1-hydroxyneomycin C, 1-deamino-1-hydroxyparomomycin I, 1,6‴-dideamino-1,6‴-dihydroxyneomycin B and 1-deamino-1-hydroxyribostamycin, or an acid addition salt thereof.

7. A method of treating a bacterial infection in a mammal in need of same which comprises administering to said mammal an antibacterially effective amount of 1-deamino-1-hydroxyneomycin B or a pharmaceutically acceptable acid addition salt thereof.

4,468,387

PESTICIDAL N-SULFONYL N'-OXALATE PHOSPHORODIAMIDO(DI)THIOATES

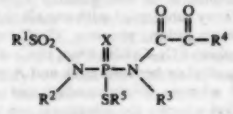
Janet Ollinger, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 21, 1982, Ser. No. 380,575

Int. Cl.³ H01N *57/28*; C07F *9/24*

U.S. Cl. 424—211 **13 Claims**

1. A compound having the formula



wherein

R^1 is an unsubstituted or substituted C_1–C_6 alkyl group wherein the substituent can be one to three of the same or different substituents selected from chloro, bromo or fluoro groups;

a C_3–C_8 cycloalkyl group;

an unsubstituted or substituted phenyl or naphthyl group, or an unsubstituted or substituted phenyl(C_1–C_5) alkyl group, wherein the substituent on the phenyl or naphthyl ring can be one to three of the same or different substituents selected from cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylamino, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxyl, phenylaminocarbonyl, alkenyloxycarbonyl, alkenylcarbonyloxy, aminocarbonyl, or alkylcarbonylamino and the like wherein the alkyl moiety thereof is a straight or branched chain group containing one to six carbon atoms;

R^2 is a hydrogen;

an unsubstituted or substituted C_1–C_6 alkyl group wherein the substituent can be a halo, cyano, alkoxy, alkylthio, alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, mono- or di-alkylamino, phenoxy or phenylthio group;

a C_3–C_8 cycloalkyl group;

a C_3–C_6 alkenyl group;

a C_3–C_6 alkynyl group;

an unsubstituted or substituted phenyl or naphthyl group, an unsubstituted or substituted phenyl(C_1–C_5)alkyl group, wherein the substituent on the phenyl or naphthyl ring can be one to three of the same or different substituents selected from cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylamino, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyoxyl, phenylaminocarbonyl, alkenyloxycarbonyl, alkenylcarbonyloxy, aminocarbonyl, or alkylcarbonylamino and the like wherein the alkyl moiety thereof is a straight or branched chain group containing one to six carbon atoms;

R^3 is hydrogen, methyl or ethyl group;

R^4 is a C_1–C_{10} alkoxy group;

a C_5–C_6 cycloalkoxy group;

a C_3–C_6 alkenyloxy group;

a C_3–C_6 alkynyloxy group;

an unsubstituted or substituted phenyloxy or naphthyloxy group, or an unsubstituted or substituted phenyl(C_1–C_5)alkyl group, wherein the substituent on the phenyl or naphthyl ring can be one to three of the same or different substituents selected from cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylamino, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyoxyl, phenylaminocarbonyl, alkenyloxycarbonyl, alkenylcarbonyloxy, aminocarbonyl, or alkylcarbonylamino and the like wherein the alkyl moiety thereof is a straight or branched chain group containing one to six carbon atoms;

a C_2–C_6 alkoxy group substituted with one to three of the same or different substituents selected from chloro, bromo, or fluoro groups or with one substituent selected from alkoxy, phenoxy, alkylthio, dialkylamino, or trialkylammonium halide;

a C_1–C_6 alkylthio group;

a C_3–C_6 cycloalkylthio group;

an unsubstituted or substituted phenylthio or naphthylthio group, wherein the substituent can be one to three of the same or different substituents selected from cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylamino, mono- or di-alkylaminocarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenyloxycarbonyl, alkenylcarbonyloxy, aminocarbonyl, or alkylcarbonylamino and the like wherein the alkyl moiety thereof is a straight or branched chain group containing one to six carbon atoms;

a di(C_1–C_6)alkylamino group;

a phenyl- or naphthyl-(C_1–C_6)alkylamino group; or

a C_1–C_6 alkyl group;

an unsubstituted or substituted benzylthio group wherein the substituent can be one to three of the same or different substituents selected from cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylamino, mono- or di-alkylaminocarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenyloxycarbonyl, alkenylcarbonyloxy, aminocarbonyl, or alkylcarbonylamino and the like wherein the alkyl moiety thereof is a straight or branched chain group containing one to six carbon atoms;

R^5 is a C_2–C_6 alkyl group; and

X is O or S.

10. A method of controlling pests comprising contacting the pests with a pesticidally effective amount of a compound according to claim **1**.

4,468,388

PESTICIDAL N-(THIO)ACYL PHOSPHORODIAMIDO(DI)THIOATES

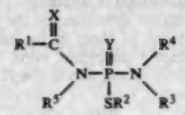
Janet Ollinger, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 21, 1982, Ser. No. 380,577

Int. Cl.³ A01N *57/26*; C07F *9/24*

U.S. Cl. 424—211 **24 Claims**

1. A compound having the formula



I

wherein

R^1 is hydrogen;

unsubstituted or substituted C_1–C_6 alkyl wherein the substituent can be one cyano, nitro, alkoxy, alkylthio, alkylsulfinyl, alkysulfonyl, alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, phenoxy or phenylthio group or from one to three of the same or different bromo, chloro or fluoro groups;

unsubstituted or substituted phenyl or naphthyl wherein the substituent can be from one to three of the same or different alkyl, haloalkyl, halo, alkoxy, alkylthio, cyano, nitro, or mono- or di-alkylamino, phenoxy, alkylsulfinyl, alkylsulfonyl, trifluoromethyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenythio, phenysulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenyloxycarbonyl, and alkenylcarbonyloxy wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms C_3–C_6 alkenyl; and

C_3–C_8 cycloalkyl;

R^2 is C_2–C_6 alkyl;

R^3 and R^5 are, independently, hydrogen, methyl or ethyl;

X and Y are, independently, O or S; and

R^4 is

(a) SR^6 wherein R^6 is unsubstituted or substituted C_1–C_6 alkyl wherein the substituent can be from one to three of the same or different chloro, bromo or fluoro groups; alkoxycarbonyl; unsubstituted or substituted phenyl or naphthyl wherein the substituent can be from one to three of the same or different alkyl, alkoxy, halo, cyano, nitro, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylamino, alkylcarbonylamino, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenylcarbonyloxy, phenoxycarbonyl, phenylaminocarbonyl, alkenyloxycarbonyl, or alkenylcarbonyloxy, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms, unsubstituted or substituted amino wherein the substituent can be one or two of the same or different C_1–C_6 alkyl, unsubstituted or substituted phenyl (C_1–C_3) alkyl wherein the substituent is on the phenyl ring and wherein the substituent can be from one to three of the same or different alkyl, haloalkyl, halo, alkoxy, alkylthio, cyano, nitro, or mono- and di-alkylamino groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms;

(b) SO_2R^6 wherein R^6 is as defined above;

(c) $SN(R^7)C(=A)Z$ wherein R^7 is unsubstituted or substitued C_1–C_6 alkyl wherein the substituent can be from one to three of the same or different chloro, bromo or fluoro groups or one cyano, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, mono- or di-alkylaminocarbonyl, alkylcarbonylamino, phenylthio, phenylsulfinyl, phenylsulfonyl, phenoxy, phenylcarbonyl, phenylcarbonyloxy, phenoxycarbonyl, phenylaminocarbonyl, alkenyloxycarbonyl, or alkenylcarbonyloxy groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms; unsubstituted or substituted phenyl or naphthyl, or unsubstituted or substituted phenyl(C_1–C_5)alkyl, wherein the substituent on the phenyl or naphthyl ring can be from one to three of the same or different cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenyloxycarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenylcarbonyloxy, aminocarbonyl, or alkylaminocarbonyl groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms; Z is unsubstituted C_1–C_{10} alkoxy or C_1–C_6 alkoxy substituted with one alkylthio, alkoxy, or dialkylamino group, phenoxy, C_1–C_6 alkylthio, phenylthio, phenyl(C_1–C_5)alkylthio, di-C_1–C_6 alkylamino, or C_1–C_6 alkyl or benzofuranyl; and A is O or S;

(d) CO_2R^8 wherein R^8 is unsubstituted or substituted C_1–C_6 alkyl wherein the substituent can be from one to three bromo, chloro or fluoro groups, unsubstituted or substituted phenyl or naphthyl, or unsubstituted or substituted phenyl(C_1–C_3) alkyl, wherein the substituent on the phenyl or naphthyl ring can be from one to three of the same or different cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenylcarbonyloxy, alkenylcarbonyloxy, aminocarbonyl, or alkylaminocarbonyl groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms; or C_2–C_3 alkenyl;

(e) C(O)-C(O)-OR^9 wherein R^9 is unsubstituted or substituted C_1–C_{10} alkyl wherein the substituent can be from one to three of the same or different chloro, bromo or fluoro groups or one cyano, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, mono- or di-alkylaminocarbonyl, alkylcarbonylamino, phenylthio, phenylsulfinyl, phenylsulfonyl, phenoxy, phenylcarbonyl, phenylcarbonyloxy, phenoxycarbonyl, phenylaminocarbonyl, alkenyloxycarbonyl, or alkenylcarbonyloxy groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms; unsubstituted or substituted phenyl or naphthyl or unsubstituted or substituted phenyl(C_1–C_3)alkyl, wherein the substituents on the phenyl or naphthyl ring can be from one to three of the same or different cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenylcarbonyloxy, alkenylcarbonyloxy, aminocarbonyl, or alkylaminocarbonyl groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms;

(f) C(O)-NH(B)R^{10} wherein B is CO or SO_2; and R^{10} is unsubstituted or substituted C_1–C_6 alkyl wherein the substituent can be from one to three bromo, chloro or fluoro groups; unsubstituted or substituted phenyl wherein the substituent can be from one to three of the same or different cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenylcarbonyloxy, alkenylcarbonyloxy, aminocarbonyl, or alkylaminocarbonyl

groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms;

(g) $C(O)NR^{11}R^{12}$ wherein R^{11} and R^{12} are, independently, hydrogen or unsubstituted or substituted C_1–C_6 alkyl wherein the substituent can be from one to three of the same or different chloro, bromo or fluoro groups or one cyano, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, mono- or di-alkylaminocarbonyl, alkylcarbonylamino, phenylthio, phenylsulfinyl, phenylsulfonyl, phenoxy, phenylcarbonyl, phenylcarbonyloxy, phenoxycarbonyl, phenylaminocarbonyl, alkenyloxycarbonyl, or alkenylcarbonyloxy groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms;

(h) $(CHR^{14})_mS(O)_nR^{13}$ or $(CHR^{14})_mOR^{13}$ wherein m is 1, 2 or 3; n is 0, 1, or 2; R^{13} is unsubstituted or substituted C_1–C_6 alkyl wherein the substituent can be from one to three of the same or different chloro, bromo or fluoro groups or one cyano, nitro, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkylcarbonyl, alkoxycarbonyl, alkylcarbonyloxy, mono- or di-alkylaminocarbonyl, alkylcarbonylamino, phenylthio, phenylsulfinyl, phenylsulfonyl, phenoxy, phenylcarbonyl, phenylcarbonyloxy, phenoxycarbonyl, phenylaminocarbonyl, alkenyloxycarbonyl, or alkenylcarbonyloxy groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms; unsubstituted or substituted phenyl(C_1–C_3)alkyl, or unsubstituted or substituted phenyl or naphthyl, wherein the substituent on the phenyl or naphthyl ring can be from one to three of the same or different cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, trifluoromethyl, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenysulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenylcarbonyloxy, alkenylcarbonyloxy, aminocarbonyl, or alkylaminocarbonyl groups, wherein the alkyl moiety is straight or branched chain and contains from one to six carbon atoms; and R^{14} is hydrogen; unsubstituted or substituted alkyl; or unsubstituted or substituted phenyl; or

(i) $C(X)R^1$ wherein X and R^1 are as defined above.

4. A compound according to claim **3** wherein:

X and Y are O;

R^2 is 1-methylpropyl;

R_3 and R_5 are each methyl; and

R^4 is

(a) SR^6 wherein R^6 is phenyl, 4-methylphenyl, methyl or trichloromethyl; or methoxycarbonyl;

(b) SO_2R^6 wherein R^6 is methyl, butyl, trifluoromethyl;

(c) $SN(R^7)(=A)$ wherein R^7 is methyl and $C(=A)Z$ is $C(O)OPr$, $C(O)Et$, $C(O)CH_3$ or $C(O)OC_{10}H_{21}$;

(d) CO_2R^8 wherein R^8 is phenylmethyl, 2-trichloroethyl, or $—CH=CH_2$;

(e) C(O)-C(O)-OR^9 wherein R^9 is methyl 1-methylethyl, ethyl, or 2-methoxyethyl

(f) C(O)-NH(B)R^{10} wherein B is SO_2 or C(O) and R^{10} is 4-methylphenyl, phenyl, or trichloromethyl; and R^{10} is 4-methylphenyl, phenyl, or trichloromethyl

(g) $C(O)NR^{11}R^{12}$ wherein R^{11} is hydrogen and R^{12} is methyl;

(h) CH_2SCH_3; or

(i) $C(X)R^1$ wherein X is O and R^1 is hydrogen or trifluoromethyl.

22. A method of controlling pests comprising contacting the pests with a pesticidally effective amount of a compound according to claim **4**.

4,468,389

PESTICIDAL N-SULFONYL PHOSPHORODIAMIDO(DI)THIOATES

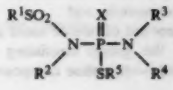
Janet Ollinger, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 21, 1982, Ser. No. 380,576

Int. Cl.[3] **A01N** *57/28; C07F 9/24*

U.S. Cl. 424—215 **16 Claims**

1. A compound having the formula:



R^1 is unsubstituted or substituted C_1–C_6 alkyl wherein the substituent can be from one to three of the same or different halogens selected from Cl, Br, or F groups;

C_3–C_8 cycloalkyl;

unsubstituted or substituted phenyl or naphthyl, or can be one to three of the same or different substituents selected from cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, mono- or di-alkylamino, mono- or di-alkylaminocarbonyl, alkoxy-carbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxy, phenylaminocarbonyl, alkenyloxycarbonyl, alkenylcarbonyloxy, aminocarbonyl, or alkylcarbonylamino and the like wherein the alkyl moiety thereof is a straight or branched chain group containing one to six carbon atoms;

R^2 is hydrogen;

unsubstituted or substituted C_1–C_6 alkyl wherein the substituent can be a halo, cyano, alkoxy, alkylthio, alkylcarbonyl, alkoxy-carbonyl, alkoxycarbonyloxy, mono- or di-alkylamino, phenoxy or phenylthio groups;

C_3–C_8 cycloalkyl;

C_3–C_6 alkenyl;

unsubstituted or substituted phenyl or naphthyl, or unsubstituted or substituted phenyl(C_1–C_5)alkyl, wherein the substituent on the phenyl or naphthyl ring can be one to three of the same or different substituents selected from cyano, nitro, halo, alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, haloalkyl, mono- or di-alkylamino, mono- or di-alkylaminocarbonyl, alkoxycarbonyl, alkylcarbonyl, alkylcarbonyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzyl, phenylcarbonyl, phenoxycarbonyl, phenylcarbonyloxyl, phenylaminocarbonyl, alkenyloxycarbonyl, alkenylcabonyloxy, aminocarbonyl, or alkylcarbonylamino and the like wherein the alkyl moiety thereof is a straight or branched chain group containing one to six carbon atoms;

C_3–C_6 alkynyl;

R^3 is hydrogen, methyl or ethyl;

R^4 is hydrogen, methyl, C_1–C_6 alkylthio(C_1–C_2)alkyl, C_1–C_6 alkoxy(C_1–C_2)alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl;

R^5 is C_2–C_6 alkyl; and

X is O or S.

13. A method of controlling pests comprising contacting the pests with a pesticidally effective amount of a compound according to claim **1**.

4,468,390
ANTHELMINTIC COMPOSITION AND THE USE THEREOF

Noritoshi Kitano, Tokyo, Japan, assignor to Sankyo Company, Limited, Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 350,641
Claims priority, application Japan, Feb. 23, 1981, 56-25058
Int. Cl.³ A61K *31/625, 31/335*
U.S. Cl. 424—232 **14 Claims**

1. An anthelmintic composition comprising:

(a) an effective amount of one or more macrolide anthelmintic agents selected from the group consisting of B-41 series antibiotics, C-076 series antibiotics and 22,23-dihydro C-076 series compounds; and

(b) an effective amount of one or more anthelmintic agents selected from the group consisting of benzimidazole, salicylamide and isoquinoline compounds.

4,468,391
COMBINATION OF β-ADRENOCEPTOR ANTAGONISTS AND ANXIOLYTIC AGENTS

Katherine Voith, Dorval, Canada, assignor to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

Filed Jun. 25, 1982, Ser. No. 392,417
Int. Cl.³ A61K *31/33*
U.S. Cl. 424—244 **8 Claims**

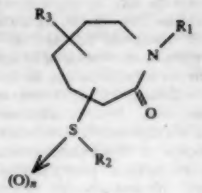
1. A method for treating pathological states of anxiety, stress or aggressivity in a mammal, without eliciting sedative effects or altering motoricity, which comprises: administering to the mammal an effective amount of a combination of a β-adrenoceptor antagonist, which does not penetrate or penetrates poorly the brain, and is selected from the group consisting of cetamolol, atenolol, nifenalol, sotalol, acebutalol, nadolol, carteolol and timolol, and one quarter to one half of the normally effective dose of a benzodiazepine tranquilizer.

4,468,392
SULPHINYL- AND SULPHONYL-AZACYCLOHEPTAN-2-ONES, AND THEIR USE AS FEED ADDITIVES

Gerd Fengler; Artur Botta, both of Krefeld; Martin Scheer, and Friedrich Berschauer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 28, 1983, Ser. No. 488,948
Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217373
Int. Cl.³ A61K *31/55*; C07D *223/10, 401/12, 417/12*
U.S. Cl. 424—244 **11 Claims**

1. A sulphinyl- or sulphonyl-azacycloheptan-2-one of the formula (I)



(I)

in which

n denotes 1 or 2,

R^1 represents H,

C_1–C_4-alkyl, optionally substituted by CN; CO(C_1–C_4-alkyl); benzoyl or C_1–C_4-carbamoyl,

R^2 denotes C_1–C_{12}-alkyl optionally substituted by NH_2, OH, COOH or phenyl; C_2–C_4-alkenyl; phenyl, optionally substituted by halogen, C_1–C_4-alkyl, CF_3, NH_2, NO_2, COO(C_1–C_4-alkyl), pyridyl or benzothiazolyl, the sulphinyl or sulphonyl radical being in the α- to δ-position, and

R_3 represents H or C_1–C_4-alkyl, and is in the α-to ω-position.

11. A method of promoting growth, improving fat to lean meat ratio in animals which comprises administering to a said animal a growth promoting, fat to lean meat ratio improving and feed utilizing amount of compound of claim 1.

4,468,393
TREATMENT OF ARTHRITIS

Charles F. Geschickter, Lorton, Va., assignor to Unimed, Inc., Somerville, N.J.

Filed Dec. 6, 1982, Ser. No. 446,949
Int. Cl.³ A61K *31/555*
U.S. Cl. 424—245 **4 Claims**

1. Method of treating arthritis, which comprises administering to a patient suffering from the same an arthritic treatment effective amount of a spirogermanium selected from the group consisting of

N-(3-dimethylaminopropyl)-2-aza-8,8-dimethyl-8-germanspiro[4:5] decane;

N-(3-dimethylaminopropyl)-2-aza-8,8-diethyl-8-germaspiro[4:5] decane;

N-(3-dimethylaminopropyl)-2-aza-8,8-dipropyl-8-germaspiro[4:5] decane; and

N-(3-dimethylaminopropyl)-2-aza-8,8-dibutyl-8-germaspiro[4:5] decane.

4,468,394

CEPHALOSPORIN COMPOUNDS

Yoshimasa Machida, Ibaraki; Isao Saito, Tokyo; Isao Sugiyama, Tokyo; Shigeto Negi, Tokyo; Seiichiro Nomoto, Tokyo; Hironori Ikuta, Tokyo; Hiroshi Yamauchi, Ibaraki, and Kyosuke Kitoh, Saitama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

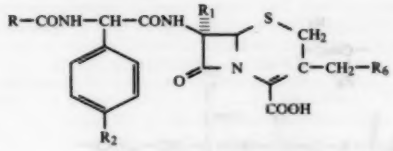
Filed Mar. 31, 1982, Ser. No. 363,778

Claims priority, application Japan, Apr. 2, 1981, 56-48437; Apr. 2, 1981, 56-48438

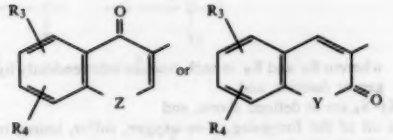
Int. Cl.³ A61K *31/545*; C07D *501/04, 501/46, 501/56*

U.S. Cl. 424—246 14 Claims

1. A compound represented by the formula:



wherein R_1 is hydrogen or methoxy; R_2 is hydrogen or hydroxy; R is



wherein R_3 and R_4 are hydroxy or acyloxy, Y is oxygen, sulfur or $=N\text{-}R_5$ wherein R_5 is hydrogen or lower alkyl, and Z is $=N\text{-}R_5$ wherein R_5 has the same meanings as defined above; and R_6 is acyloxy or substituted or unsubstituted nitrogen-containing heterocyclicthio, a pharmaceutically acceptable salt thereof, or a carboxylic ester thereof.

13. An antibacterial composition which comprises an antibacterially effective amount of a compound or pharmaceutically acceptable salt or ester thereof as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4,468,395

PROSTAGLANDINS AND PROSTACYCLINS, PROCESSER FOR THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Helmut Vorbrügen; Walter Elger; Michael-Harold Town, and Ekkehard Schillinger, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

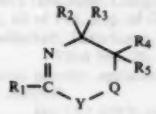
Continuation-in-part of Ser. No. 367,869, Apr. 13, 1982, abandoned. This application May 20, 1982, Ser. No. 380,326

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1981, 3115997; Nov. 13, 1981, 3145830

Int. Cl.³ C07D *263/14, 233/14, 277/10*; A61K *31/42*

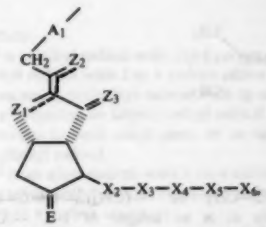
U.S. Cl. 424—246 25 Claims

1. A compound of the formula



wherein

R_1 is a prostacyclin residue of the formula



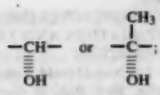
wherein

E is oxygen; hydrogen and α-hydroxy; hydrogen and α—CH_3; or hydrogen and α—CH_2OH;

X_2 is —CH_2—CH_2—, —C≡C—, or trans-alkenylene of the formula

wherein R_8 and R_9 each independently is hydrogen or C_1–C_6-alkyl;

X_3 is

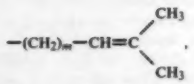


X_4 is $-(CH_2)_n-$, wherein n is an integer of 1–3, or

wherein R_{10} and R_{11} each independently is hydrogen, fluorine, methyl or methoxy, or R_{10} and R_{11} jointly represent $-CH_2-CH_2-$ or $-CH_2-CH_2-CH_2-$;

X_5 is $-CH_2-$, oxygen, sulfur, or a direct bond; and

X_6 is phenyl, 3- or 4-chlorophenyl, 3-trifluoromethylphenyl, α- or β-naphthyl, 2- or 3-furyl, 2- or 3-thienyl, 2-, 3-, or 4-pyridyl or, when X_5 is a direct bond, X_6 is



$-(CH_2)_m-C\equiv C-CH_3$ or $-(CH_2)_m-C\equiv C-CH_2-CH_3$, wherein m is an integer of 1–2, $-(CH_2)_4-OCH_3$, $-CH(CH_3)-CH_2-CH_2-CH_3$, $-CH_2-CH_2-CH_2-CH_3$ or $-(CH_2)_3-CH=CH_2$;

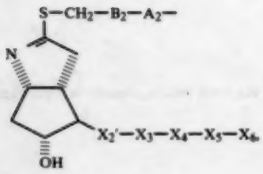
A_1 is $-(CH_2)_n-$, $-(CH_2)_m-O-$, $-CF_2-(CH_2)_m-$, wherein n is an integer of 1–3 and m is an integer of 1–2, $-CH=CH-CH_2-$ or $-CH_2-CH=CH-$, and

Z_3 is H_2 or oxygen;

(i) Z_1 is oxygen or CH_2 when Z_2 is hydrogen, or cyano; or

(ii) Z_1 is nitrogen when Z_2 is H_2; or

(III) R_1 is a prostacyclin residue of the formula



wherein

A_2 is $-CH_2-$, $-CF_2-$,

or when B_2 is a direct bond, can also be trans-alkenylene of the formula

B_2 is $-CH_2-$ or a direct bond,

X_2' is $-CH_2-CH_2-$, $-C\equiv C-$, or trans-alkenylene of formula

wherein R_8' and R_9' in each case are independently hydrogen or fluorine, and

X_3–X_6 are as defined above, and

in all of the foregoing, Y is oxygen, sulfur, imino, or N-(C_1–C_4-alkyl)imino;

Q is $(CR_6R_7)_p$ wherein p is an integer of 0 to 3,

R_2 is hydrogen; alkyl of 1–6 carbon atoms; alkyl of 1–6 carbon atoms substituted by hydroxy, amino, nitro, fluorine, chlorine, bromine, C_1–C_4-alkoxycarbonyl, di-C_1–C_4-alkylaminocarbonyl, C_1–C_4-alkylaminocarbonyl, tri-C_1–C_4-alkylsilyloxy, tetrahydropyranyloxy, or benzoyloxy; C_1–C_4-alkoxycarbonyl; benzyloxycarbonyl; cyano; or di-C_1–C_4-alkylaminocarbonyl;

R_3, R_4, R_5, R_6 and R_7 each independently is hydrogen; alkyl of 1–6 carbon atoms; alkyl of 1–6 carbon atoms substituted as recited for R_2; or C_{6-10}-aryl; and

R_3 and R_4 together also can form trimethylene, tetramethylene, or 1,3-butadienylene when R_2 and R_5 jointly represent an additional bond;

or a corresponding compound wherein in at least one OH group, the H atom is replaced by tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butylsilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid.

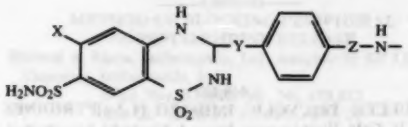
4,468,396

ANTIHYPERTENSIVE BENZOTHIADIAZINES

Charles V. Magatti, Verona, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Dec. 20, 1982, Ser. No. 450,865
Int. Cl.³ C07D 417/12; A61K 31/54
U.S. Cl. 424—246 **22 Claims**

1. A compound represented by the formula



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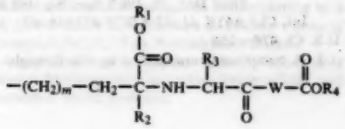
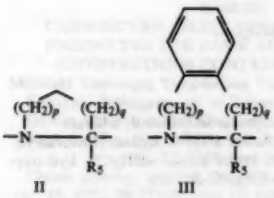
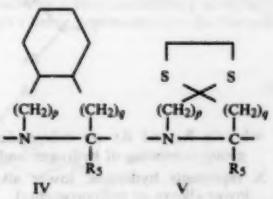


and the salts thereof, wherein
W is



II III



IV V

X is halogen or CF_3;
Y is $—CH_2—$, $—CH_2O—$, $—CH_2S—$, $—CH_2OCH_2—$, or $—CH_2SCH_2—$;
Z is sulfonyl or carbonyl;
R_1, R_2, R_4 and R_5 are hydrogen or lower alkyl;
R_3 is hydrogen, lower alkyl, or amino lower alkyl;
m is 0 to 5; and
p is 0, 1 or 2 and q is 0, 1 or 2, provided that the sum of p and q is 1 or 2, and that in formula V p is not 0.

2. A compound of claim **1** wherein said salts are nontoxic, pharmaceutically acceptable salts.

22. A method of treating hypertension in mammals comprising administering to a mammal in need of such treatment an antihypertensive and diuretic effective amount of a composition of claim **2**.

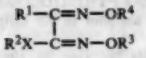
4,468,397

COMBATING PESTS WITH NOVEL IMINO ETHERS

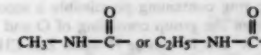
Johannes Schmetzer, Cologne; Jörg Stetter, Wuppertal; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,337
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039269
Int. Cl.³ A01N 43/08, 43/10, 43/18, 43/20
U.S. Cl. 424—248.51 **11 Claims**

1. A hydroxamic acid ester of the formula



in which
R^1 is an alkyl radical with 1 to 4 carbon atoms, a halogenoalkyl radical with 1 to 4 carbon atoms and up to 5 halogen atoms, a cycloalkyl radical with up to 8 carbon atoms, an alkoxyalkyl or alkylthioalkyl radical with up to 3 carbon atoms in each alkyl part, or an optionally substituted phenyl radical,
R^2 is an alkyl radical with 1 to 4 carbon atoms, an alkenyl radical with 1 to 4 carbon atoms or an alkinyl radical with 1 to 4 carbon atoms, or
R^1 and R^2 together are an optionally methyl-substituted methylene, ethylene or propylene bridge,
one of the radicals R^3 and R^4 is an alkyl radical with 1 to 4 carbon atoms, an alkenyl radical with 2 to 4 carbon atoms, a halogenoalkyl radical with 1 to 4 carbon atoms and up to 3 halogen atoms, a halogenoalkenyl radical with 2 to 4 carbon atoms and up to 3 halogen atoms or an alkoxyalkyl radical with up to 2 carbon atoms in each alkyl part, while the other of R^3 or R^4 is



and X is O or S.

10. A method of combating pests, comprising applying to the pests, or to a habitat thereof, a pesticidally effective amount of a compound according to claim **1**.

4,468,398

METHOD FOR TREATMENT OF RHEUMATOID ARTHRITIS

Lewis A. Johnson, 1050 Park Ave., New York, N.Y. 10028, and Emil Wirostko, E. 208 Midland Ave., Paramus, N.J. 07652

Continuation of Ser. No. 136,664, Apr. 2, 1980, abandoned, which is a division of Ser. No. 932,904, Aug. 11, 1978, Pat. No. 4,220,657, which is a division of Ser. No. 453,463, Jan. 23, 1974, abandoned. This application Oct. 21, 1981, Ser. No. 313,269

Int. Cl.³ A61K *31/495*

U.S. Cl. 424—250 **1 Claim**

1. A method of treating rheumatoid arthritis having as its etiological agent the micro-organism *Micromyces intracellularis*, said process comprising administering to a patient having the disease an effective amount therefor of 3[[(4-methyl-1-piperazinyl)imino]methyl]-rifamycin SV.

4,468,399

2-[2-(2-AMINOALKYL-4-THIAZOLYLMETHYLTHIO)ALKYL]-AMINO-5-SUBSTITUTED-4-PYRIMIDONES

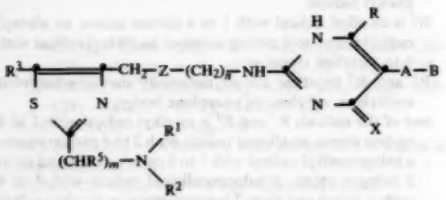
Richard P. Pioch, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 334,784, Dec. 28, 1981, abandoned. This application Jul. 20, 1983, Ser. No. 515,726

Int. Cl.³ C07D *417/12, 417/06, 417/14*; A61K *31/505*

U.S. Cl. 424—251 **54 Claims**

41. A compound of the formula



wherein each of R, R^1, R^2 and R^3 are individually H or (C_1–C_3) alkyl, R^1 can additionally be benzyl or benzoyl when R^2 is (C_1–C_3) alkyl, and when taken together with the nitrogen to which they are attached, R^1 and R^2 represent a saturated 5–7 membered heterocyclic ring containing permissibly a second hetero atom selected from the group consisting of O and N; except that only one of R^1 and R^2 can be H when Z is CH_2;

Z is O, S or CH_2;

X is S or O;

n is 2 or 3 when Z is O or S and n is 1, 2 or 3 when Z is CH_2;

R^5 is H or CH_3;

m is 1, 2 or 3;

A is (C_1–C_5) alkylene or $(CH_2)_qX(CH_2)_p$ wherein q and p are individually 0, 1, 2 or 3 and the sum of q plus p is 0–4, and

B is H, CH_3, (C_3–C_6)cycloalkyl, naphthyl, pyridyl, (C_1–C_3)alkylpyridyl, di(C_1–C_3)alkylpyridyl, hydroxypyridyl, (C_1–C_3)alkyloxypyridyl, imidazolyl, furyl, thienyl, thiazolyl, tetrahydrofuryl, 5-(1,3-benzodioxolyl), 6-(2,3-dihydro-1,4-benzodioxinyl), phenyl permissibly substituted with methylenedioxy or 1 or 2 (same or different) (C_1–C_3)alkyl, (C_1–C_3)alkyloxy, halo, OH, benzyloxy, CF_3, (C_1–C_3)alkyl-O-(C_1–C_3)alkylene, phenoxy or di[(C_1–C_3)alkyl]amino(C_1–C_3)alkylene groups; and pharmaceutically-acceptable acid-addition salts thereof.

4,468,400

ANTIULCER TRICYCLIC IMIDAZO [1,2-a]PYRIDINES

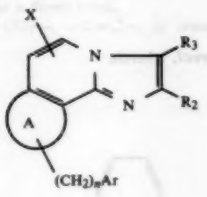
Elijah H. Gold, West Orange; James J. Kaminski, Long Valley, and Chester Puchalski, Dover, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 20, 1982, Ser. No. 450,862

Int. Cl.³ A61K *31/47*; C07D *471/04, 471/14, 491/052*

U.S. Cl. 424—256 **17 Claims**

1. A compound represented by the formula



or a pharmaceutically acceptable salt thereof; wherein

R_2 represents hydroxy, lower alkyl or hydroxyloweralkyl;

R_3 represents hydrogen, lower alkyl, —CH_2CN, hydroxyloweralkyl, —NO, —CH_2NC or

wherein R_4 and R_5 are independently selected from the group consisting of hydrogen and lower alkyl;

X represents hydrogen, lower alkyl, halogen, hydroxy, lower alkoxy or trifluoromethyl;

A is a non-aromatic ring fused to the pyridine ring containing, with the carbon atoms of the pyridine ring to which it is attached, 5 or 6 ring atoms of which all are carbon or one is selected from nitrogen, sulfur or oxygen with the remaining atoms being carbon wherein the heteroatom of the 5-membered ring is at the 7 or 9 position and the heteroatom of the 6-membered ring is at the 10 position;

Ar represents phenyl, pyridyl, thienyl, imidazolyl, furanyl or X'- Y'- and Z'- substituted- phenyl wherein each of X'-, Y'- and Z'- independently is as defined for X; and n is zero, one or two.

16. A method for inhibiting gastrointestinal irritation and damage in mammals due to administration of drugs which induce gastrointestinal irritation and damage which comprises administering a therapeutically effective amount of a compound of claim 1 during the term said gastrointestinal irritating and damaging drug is administered for its therapeutic effect.

4,468,401
METHOD OF BLOCKING PERIPHERAL NOREPINEPHRINE RELEASE

Richard A. Hahn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 3, 1982, Ser. No. 438,833
Int. Cl.³ A61K *31/47*; C07D *471/04*
U.S. Cl. 424—258 4 Claims

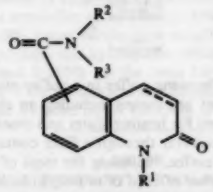
1. The method of blocking norepinephrine release from peripheral sympathetic nerve terminals that innervate arterial muscle fibers in mammals which comprises administering to a mammal having an elevated blood pressure an effective dose of trans-4aR-5-n-propyl-4,4a,5,6,7,8,8a,9-octahydro-1H(and 2H)pyrazolo[3,4-g]quinoline or a pharmaceutically acceptable salt thereof, thereby blocking said norepinephrine release and reducing said elevated blood pressure.

4,468,402
CARBOSTYRIL DERIVATIVES, PROCESS FOR PRODUCING THE SAME AND CARDIOTONIC COMPOSITIONS CONTAINING THE SAME

Michiaki Tominaga; Yung-hsiung Yang; Hidenori Ogawa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

Division of Ser. No. 348,709, Feb. 16, 1982,. This application Aug. 22, 1983, Ser. No. 525,284
Claims priority, application Japan, Feb. 17, 1981, 56-22437; Apr. 15, 1981, 56-57732; Aug. 12, 1981, 56-127145
Int. Cl.³ C07D *215/20*; A61K *31/47*
U.S. Cl. 424—258 2 Claims

1. A carbostyril derivative or a pharmaceutically acceptable salt thereof said derivative being represented by the formula (1),



(1)

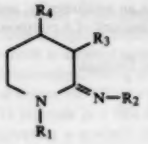
wherein R^1 is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a phenyl-lower alkyl group; R^2 and R^3 may be the same or different and each is a lower alkyl group which may have one hydroxy group or one halogen atom as the substituent, or a phenyl-lower alkyl group which may have 1 to 3 substituents selected from the group consisting of a lower alkoxy group and a halogen atom on the phenyl ring, or said phenyl-lower alkyl group may have a lower alkylene-dioxy group as the substituent on the phenyl ring; further R^2 and R^3 may form, together with the adjacent nitrogen and without an additional hetero-atom, a 5- or 6-membered saturated heterocyclic ring which may have a lower alkyl group or a phenyl-lower alkyl group as the substituent; the carbon-carbon bond between 3- and 4-positions in the carbostyril skeleton being a single or double bond.

4,468,403
ANALGESIC SUBSTITUTED PIPERIDYLIDENE-2-SULFON(CYAN)AMIDE DERIVATIVES

Edward E. Knaus, Edmonton; Brent K. Warren, Calgary, and Theodore A. Ondrus, Edmonton, all of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jul. 20, 1982, Ser. No. 399,994
Int. Cl.³ A61K *31/445*; C07D *401/12, 211/72*
U.S. Cl. 424—267 38 Claims

1. A 1-alkyl(arylalkyl,cycloalkylalkyl,alkenyl)piperidylidene-2-sulfonamide or -2-cyanamide of the formula (1):



(1)

or a non-toxic pharmaceutically acceptable salt thereof, wherein R_1 is a lower alkyl, phenyl lower alkyl, amino substituted phenyl lower alkyl, nitro substituted phenyl lower alkyl, cycloloweralkyl lower alkyl or lower alkenyl substituent; R_2 are selected from the group consisting of cyano, pyridyl sulfonyl, lower alkyl substituted sulfonyl, phenylsulfonyl, lower alkoxy substituted phenylsulfonyl, halogen substituted phenylsulfonyl, nitro substituted phenylsulfonyl, amino substituted phenylsulfonyl and lower alkanoylamino substituted phenylsulfonyl; R_3 is a hydrogen or halogen atom; and R_4 is a hydrogen, lower alkyl or lower alkoxy substituent.

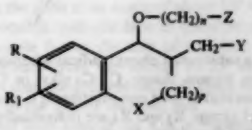
36. A composition comprising the compound of claim 1 in a pharmaceutical carrier, sufficient active compound being present so that the composition has analgesic-agonist or analgesic-antagonist activity.

4,468,404
3-ARALKYLOXY-2,3-DIHYDRO-2-(TRIAZOLYMETHYL)-BENZO(B)THIOPHENES

Dinanath F. Rane, Emerson, N.J.; John J. Wright, Evansville, Ind. and Russell E. Pike, Stanhope, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 215,948, Dec. 12, 1980, Pat. No. 4,352,808. This application Jul. 29, 1982, Ser. No. 403,275
Int. Cl.³ A01N *43/64, 43/78*; C07D *405/06, 409/06*
U.S. Cl. 424—269 15 Claims

1. A compound selected from the group consisting of a compound defined by formula:



wherein

n is 0 to 4;

p is 0 or 1;

R and R_1 are independently H, lower alkyl, halogen, halogenated lower alkyl, nitro, or amino;

X is sulfur, sulfinyl, or sulfonyl;

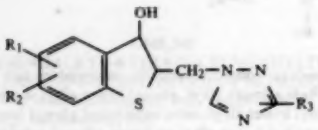
Y is 1,2,4-triazolyl or 1,2,4-triazolyl substituted by lower alkyl or aryl, said aryl being a member selected from the group consisting of phenyl, halophenyl, and loweralkylphenyl;

Z is a member selected from the group consisting of alkyl of 1 to 10 carbons, alkenyl of 3 to 10 carbons, alkynyl of 3 to 10 carbons, cycloalkyl of 3 to 6 carbons, and heterocyclic aromatic groups selected from the group consisting of 2-thienyl, 3-thienyl, pyridyl, quinolyl, thiazolyl and furanyl, and the lower alkyl and halogen substituted derivatives thereof, provided that when n is 0, Z is not 1-alkynyl; and where n is 1 to 4, Z is also a member selected from the group consisting of phenyl, phenyl substituted by lower alkyl, halogen, or N-(N'-lower alkanoylpiperazine), alkoxy of 1 to 10 carbons, alkylthio of 1 to 10 carbons, aryloxy, and arylthio, wherein said aryl is a member selected from the group consisting of phenyl, halophenyl, and lower alkyl phenyl;

and the pharmaceutically acceptable acid addition salts thereof.

10. A composition useful for inhibiting the growth of fungi, bacteria or protozoa which comprises an antifungally, antibacterially, or antiprotozoally effective amount of a compound of claim **1** in admixture with a carrier.

15. Compounds represented by the formula



wherein

R and R_1 are independently hydrogen, lower alkyl, halogen, halogenated lower alkyl, nitro, or amino; and

R_3 is hydrogen, lower alkyl or aryl, said aryl being a member selected from the group consisting of phenyl, halophenyl, and loweralkylphenyl.

4,468,405

SUBSTITUTED N-AROYL N'-PHENYL UREA COMPOUNDS

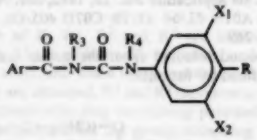
Raymond H. Rigterink, Midland, Mich., and Ronald J. Sbragia, Clayton, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 288,620, Jul. 30, 1981,. This application Jul. 26, 1982, Ser. No. 401,491

Int. Cl.[3] **A01N** *33/10, 43/50;* **C07C** *127/22;* **C07D** *233/96*

U.S. Cl. 424—322 **24 Claims**

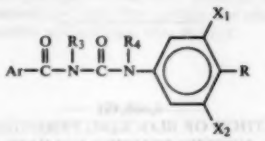
1. A compound having the formula



wherein Ar is a substituted phenyl radical wherein the substituents are chloro, bromo, fluoro, C_1–C_3 alkyl or C_1–C_3 alkoxy, with the proviso that at least one substituent is positioned ortho to the carbonyl group; R_3 and R_4 are individually H or C_1–C_4 alkyl or together they form the group

X_1 and X_2 are halogen and R is a fluorine containing C_1–C_4 haloalkoxy group.

17. A method for killing and/or controlling insects which comprises applying to the insects, the insect larvae or their habitats an insecticidally effective amount of a compound having the formula



wherein Ar is a substituted phenyl radical wherein the substituents are chloro, bromo, fluoro, C_1–C_3 alkyl or C_1–C_3 alkoxy, with the proviso that at least one substituent is positioned ortho to the carbonyl group; R_3 and R_4 are individually H or C_1–C_4 alkyl or together they form the group

X_1 and X_2 are halogen and R is a fluorine containing C_1–C_4 haloalkoxy group.

4,468,406

METHOD FOR AUTOMATICALLY BREWING COFFEE AND MACHINE THEREFOR

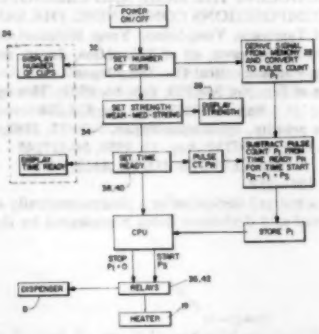
Stephane M. d'Alayer de Costemore d'Arc, Ways, Belgium, assignor to Staar S.A., Brussels, Belgium

Filed May 19, 1982, Ser. No. 379,716

Claims priority, application Belgium, May 20, 1981, 888.878

Int. Cl.[3] **A23F** *5/26*

U.S. Cl. 426—231 **5 Claims**



1. A method for brewing coffee in a coffee machine having a reservoir for water and means including an electrical resistance heating element for heating water and causing hot water to flow from the reservoir through a filter containing ground coffee for brewing coffee, including the steps of:

selecting the number of cups of coffee, to be brewed;

deriving from electrical memory means a digital signal representing a pulse count of pulses generated at a predetermined frequency for a timed period of heating and hot water flow to brew a selected number of cups;

storing said pulse count signal in static memory;

heating and causing hot water to flow from said reservoir to said filter;

generating pulses at said predetermined frequency and decrementing said pulse count signal with such generated

pulses so that the remainder of a timed period represented by said signal is stored in said static memory in the event of a loss of power and interruption of water flow, allowing resumption of water flow for the remainder of said time period after power is restored, and

terminating heating and flow of hot water in response to the pulse count signal being fully decremented, indicating the termination of said timed period for brewing the number of cups selected.

4,468,407

PROCESS FOR THE REDUCTION OF ALCOHOL CONTENT OF BEVERAGES

Peter J. Vella, Modesto, Calif., assignor to E. & J. Gallo Winery, Modesto, Calif.

Filed Aug. 5, 1982, Ser. No. 405,494
Int. Cl.³ C12G *3/08*
U.S. Cl. 426—592 **4 Claims**

1. A process for producing wine containing from about 7.0% to about 9.5% alcohol by volume which comprises

(a) chilling a standard wine containing from about 10% to about 14% alcohol by volume to a temperature of from about 0° F. to about 30° F. to convert a substantial portion thereof to crystals,

(b) consolidating said crystals into a substantially solid mass within a high-alcohol liquid fraction,

(c) separating said solid mass from said high-alcohol liquid fraction,

(d) thawing said solid mass under approximately ambient conditions to form a low-alcohol wine fraction,

(e) combining said low-alcohol fraction with either a portion of sia high-alcohol fraction or a further quantity of said standard wine, in volumes of relative size selected to produce a blend containing from about 7.0% to about 9.5% alcohol by volume.

4,468,408

LOW-FAT, BUTTER-FLAVORED, LIQUID SPREAD AND PROCESS

Peter M. Bosco, Brookfield Center, and William L. Sledzieski, Norwalk, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 095,645, Nov. 19, 1979, Pat. No. 4,292,333. This application Sep. 14, 1981, Ser. No. 301,963
The portion of the term of this patent subsequent to Jul. 21, 1998, has been disclaimed.
Int. Cl.³ A23D *3/00*
U.S. Cl. 426—604 **9 Claims**

1. A low-fat, butter-flavored, liquid spread comprising: butter flavor; a dispersed phase comprising from 5 to 40% fat, based on the weight of the spread; from about 65 to about 92% water, based on the weight of the spread; a continuous aqueous phase including a stabilizer; and an emulsifier system comprising a combination of a lipophilic emulsifier and a hydrophilic emulsifier, the emulsifier system being present in an amount of from 0.1 to 4.0%, based on the total weight of the spread, and each of the lipophilic and hydrophilic emulsifiers are present at levels of at least 0.025% on the same basis; the relative and total amounts of the emulsifiers and the stabilizer being effective to provide a stable, liquid emulsion at about 40° F.

4,468,409

METHOD FOR THE CONTINUOUS PRODUCTION OF CONFECTIONS

Douglas J. Metzroth, Louisville, Ky., assignor to Chemetron Process Equipment, Inc., Louisville, Ky.

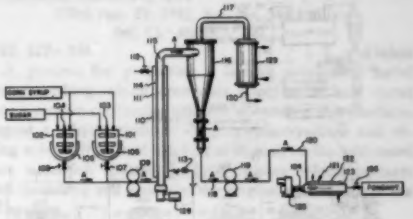
Continuation-in-part of Ser. No. 298,685, Sep. 2, 1981, abandoned. This application Oct. 29, 1982, Ser. No. 437,661
Int. Cl.³ A23G *3/00, 3/14, 3/16*
U.S. Cl. 426—659 **17 Claims**

1. A process for preparing a fine grained confection from a sucrose solution on a continuous basis comprising:

forming a homogeneous aqueous solution comprised of corn syrup and sucrose;

continuously feeding the homogeneous solution to a heating apparatus having an inlet and an outlet with heating means interposed therebetween to provide an increasing temperature to said solution from the inlet to the outlet;

heating the homogeneous solution to a predetermined temperature;



continuously separating water vapor from said solution to form a sugar solution of a predetermined concentration which is supersaturated at up to 185° F.;

continuously cooling the supersaturated sugar solution to at or below 185° F. at a residence time of equal to or less than 33 seconds in a filled vessel; and

recovering a grained confection so produced.

4,468,410

METHOD AND APPARATUS FOR PRODUCING A MICROSCOPIC SPECIMEN SLIDE

Hasan I. Zeya, Tampa, Fla., assignor to Immunomed Corp., Tampa, Fla.

Filed Aug. 18, 1982, Ser. No. 409,157
Int. Cl.³ B05D *1/00*
U.S. Cl. 427—2 **30 Claims**

1. A method of producing a streak of a liquid on a microscope slide, cover slip or the like, which method comprises:

placing a liquid sample on one side of a slide;

positioning the slide at an angle of about 10° to 70° from an axis of rotation with the face of the slide containing the liquid sample facing the axis of rotation, and with the radial distance from the sample to the axis of rotation being less than the greatest radial distance from one end of the slide to the axis of rotation; and

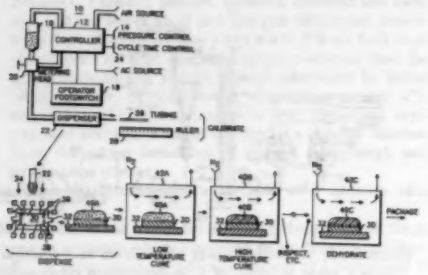
spinning said slide around the axis of rotation while maintaining said angle so that it travels in a path which defines a truncated conical shell;

whereby the centrifugal force thereby applied to the liquid sample causes the liquid to flow along the slide surface and form a thin streak thereon.

4,468,411
METHOD FOR PROVIDING ALPHA PARTICLE PROTECTION FOR AN INTEGRATED CIRCUIT DIE

James W. Sloan; Truoc T. Tran, and Frank T. Jones, III, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 5, 1982, Ser. No. 365,724
Int. Cl.³ H01L *21/312, 23/00*
U.S. Cl. 427—8 12 Claims



1. A method for providing alpha particle protection for an integrated circuit die which has been mounted for packaging and electrically connected to conductor leads integral with such packaging, comprising the steps of:

depositing a selected quantity of a liquid polyimide precursor compound having a predetermined solids content and viscosity on the active surface of the die to form a liquid polyimide precursor coating thereon;

curing the coating for a first time period at a first temperature selected to reduce the volatile content thereof below a predetermined level, and for a second time period at a second temperature selected to substantially complete the imidization thereof and the removal of the remaining volatile content thereof; and

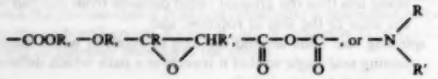
substantially immediately prior to packaging the coated die, dehydrating the coating for a third time period at a third temperature selected to remove moisture absorbed by the coating since the curing thereof.

4,468,412
PROCESS FOR APPLYING LIGHT- OR RADIATION-CURABLE RESIN COMPOSITION TO POLYOLEFIN MOLDINGS

Yoshikazu Fujii, Shiga; Tomizou Kondo, Kyoto; Hideo Shinonaga, Osaka, and Kaoru Kitadono, Shiga, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 18, 1983, Ser. No. 524,477
Claims priority, application Japan, Aug. 19, 1982, 57-144375; Apr. 4, 1983, 58-59596; Apr. 5, 1983, 58-60490; Apr. 15, 1983, 58-67644; May 10, 1983, 58-82312
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—38 13 Claims

1. A process for applying a light- or radiation-curable resin composition onto a polyolefin molding comprising surface treating a molding of polyolefin composition composed of 99.99 to 0 wt% of a polyolefin and 0.01 to 100 wt% of an olefinic polymeric compound having polar groups represented by the formula, —OCOR,



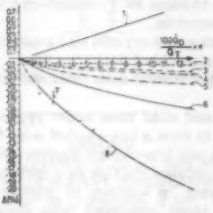
wherein R and R′ are each a hydrogen atom or a hydrocarbon group having 1 to 8 carbon atoms,

by at least one pretreatment method selected from the group consisting of a treatment with a halogenated hydrocarbon solvent, a low temperature plasma treatment, a corona discharge treatment, a flame treatment and an alkali degreasing treatment, and applying onto the thus treated molding surface a light- or radiation-curable resin composition to thereby give the molding surface excellent properties in scratch resistance, hardness and adhesion.

4,468,413
METHOD OF MANUFACTURING FLUORINE-DOPED OPTICAL FIBERS

Peter K. Bachmann, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1982, Ser. No. 443,006
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 3205345
Int. Cl.³ B05D *3/06*; C23C *11/00*
U.S. Cl. 427—39 5 Claims



1. A method of manufacturing fluorine-doped optical fiber preforms comprising the steps of:

providing gases or vapors of oxygen, $SiCl_4$, and C_2F_6;

mixing the gases and vapors;

passing the mixture through a glass tube having an inner wall;

causing the mixture to react to produce at least one fluorine-doped glass layer on the inner wall of the tube, said layer having a refractive index; and

providing at least one glass core layer on the fluorine-doped glass layer, said glass layer having a refractive index greater than the refractive index of the fluorine-doped layer.

4,468,414
DIELECTRIC ISOLATION FABRICATION FOR LASER TRIMMING

N. W. Van Vonno, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jul. 29, 1983, Ser. No. 518,725
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—53.1 5 Claims

1. A method of fabricating a thin film resistor comprising:

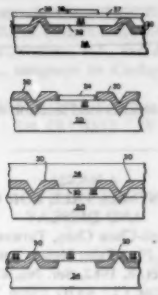
forming a plurality of single crystal islands dielectrically isolated from a polycrystalline support, one or more of which include an opening in the bottom of said dielectric isolation to optically expose a portion of said polycrystalline support from the top surface of said single crystal island;

forming an isolation layer on said top surface of said single crystal island;

forming a layer of conductive material on said surface isolation layer;

delineating said conductive material to form a thin film

resistor juxtaposed with said opening in said bottom of said dielectric isolation; and



subjecting said thin film resistor to laser radiation to further remove portions of said conductive layer.

4,468,415

INDIUM-ANTIMONY COMPLEX CRYSTAL SEMICONDUCTOR AND PROCESS FOR PRODUCTION THEREOF

Keiji Kuboyama; Takeki Matsui, and Takeo Kimura, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1982, Ser. No. 361,939

Claims priority, application Japan, Mar. 30, 1981, 56-46962; Apr. 3, 1981, 56-50294; Apr. 18, 1981, 56-58724; May 14, 1981, 56-72464; Oct. 28, 1981, 56-177394

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—91 **5 Claims**

1. A process for producing an indium-antimony complex crystalline semiconductor consisting essentially of crystals of an indium-antimony compound and crystals of indium alone by vacuum depositing vapors of indium and antimony on a substrate in such a manner that the arrival rate ratio of indium to antimony is controlled to be within the range of from 1.1/1 to 1.7/1.

4,468,416

ELECTROLYTIC ELECTRODES HAVING HIGH DURABILITY AND PROCESS FOR THE PRODUCTION OF SAME

Hiroshi Asano, Chiba; Takayuki Shimamune, Tokyo, and Hideo Nitta, Kanagawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Division of Ser. No. 379,699, May 19, 1982,. This application Sep. 15, 1983, Ser. No. 532,625

Claims priority, application Japan, May 19, 1981, 56-74296

Int. Cl.³ C25B *11/00*

U.S. Cl. 427—126.5 **2 Claims**

1. A process for producing an electrolytic electrode having high durability for use in electrolysis where the generation of oxygen occurs which comprises:

coating an electrode substrate of titanium or a titanium-based alloy with an electrically conductive oxide of tantalum, niobium or a mixture thereof in a thickness, calculated as the metal, of 0.001 to 2 g/m^2 by a thermal decomposition method to thereby form a layer thereon; and

forming an electrode coating comprising a platinum group metal oxide or a mixed oxide of a platinum group metal oxide and a valve metal oxide on the layer on the substrate.

4,468,417

PREVENTION OF METAL TARNISH

John T. Garbutt, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed Jan. 29, 1982, Ser. No. 344,216

Int. Cl.³ B65B *33/00*

U.S. Cl. 427—156 **2 Claims**

1. A process for protecting a tarnish susceptible metal against tarnishing which comprises applying to said metal surface a protein-containing solution containing as a plasticizing agent a dihydroxyalkane or polyhydroxyalkane and removing solvent from said solution to deposit on the said metal surface a tarnish resistant protein coating which protects against tarnishing and maintains the original appearance of the metal surface.

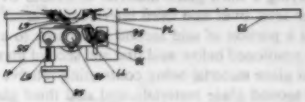
4,468,418

PROCESS FOR APPLYING THERMOPLASTIC ADHESIVE TO FLEXIBLE DIE-CUT PARTS

D. Bruce Freeman; Bernard G. Kesse, both of Cincinnati, Ohio, and Philip P. Thiel, Ft. Mitchell, Ky., assignors to The Louis G. Freeman Company, Erlanger, Ky.

Filed Feb. 7, 1983, Ser. No. 464,156

Int. Cl.³ B05D *5/10*

U.S. Cl. 427—208.2 **5 Claims**

U.S. Patent Aug. 28, 1984 Sheet 4 of 5 4,

1. A process for applying thermoplastic adhesive to a die-cut part comprising the steps of:

providing a mixing roll and a reservoir of molten thermoplastic adhesive, rotating the mixing roll in the reservoir of adhesive, whereby a quantity of adhesive is carried on the surface of the mixing roll;

providing a rotating applicator roll which has a pattern of indentations and a series of spaced circumferential grooves in its surface, transferring the adhesive from the surface of the mixing roll to said rotating applicator roll;

providing a primary wiper, wiping the surface of the applicator roll with the primary wiper to remove excess adhesive from the outer surface and grooves;

providing a pressure roll, rotating said pressure roll in a direction opposite that of said rotating applicator roll, passing the die-cut part between the applicator roll and a pressure roll, whereby the adhesive is transferred from the indentations in the applicator roll to the surface of the part; and

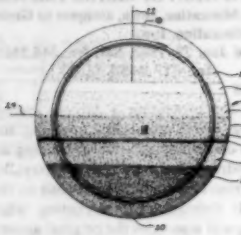
providing stripping means which act in conjunction with the grooves of the applicator roll to guide the part away from the applicator roll and pressure roll.

4,468,419

METHOD OF MAKING A DINNERWARE ARTICLE

James W. McBride, Seattle, Wash., assignor to Fabrik, Inc., Seattle, Wash.

Filed Mar. 3, 1980, Ser. No. 126,281
Int. Cl.³ B05D 1/18, 5/06
U.S. Cl. 427—266 12 Claims



1. A method for making a decorative dinnerware article by applying a pattern on the dinnerware piece, said piece having an upper edge and a lower edge, said method comprising:

a. applying a first glaze material to said piece in a manner that said first glaze material reaches between said upper edge to a first glaze line positioned between said lower and upper edges to create a first glaze area;

b. applying a second glaze material to said piece in a manner that said second glaze material extends between said lower edge to a second glaze line positioned below said first glaze line to create a second glaze area and a third intermediate area between said first and second glaze areas;

c. applying a third glaze material to extend over said first glaze area, over said third intermediate area, and over at least a portion of said second glaze area to a third glaze line positioned below said first and second glaze lines, said third glaze material being contrasting relative to said first and second glaze materials, and said third glaze material being characterized in that a combination of the third glaze material being applied over said first or second glaze materials produces a combined glaze material differing in appearance from any one of said first, second or third glaze materials separately;

d. subjecting said piece to a finishing process to cause said first, second and third glaze materials to become bonded to said dinnerware piece;

whereby said piece becomes formed with a pattern of at least four sections, namely a first upper section corresponding to a combination of the first and third glaze materials, a second section corresponding to said third glaze material, a third section corresponding to a combination of said third and second glaze materials, and a fourth lower section corresponding to said second glaze material.

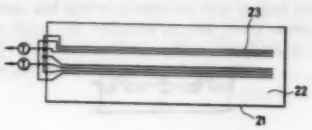
4,468,420

METHOD FOR MAKING A SILICON DIOXIDE COATING

Hideo Kawahara, Toyonaka; Hirotsugu Nagayama, Nishinomiya, and Hisao Honda, Itami, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Japan

Filed Oct. 3, 1983, Ser. No. 538,289
Claims priority, application Japan, Jul. 14, 1983, 58-128261; Jul. 27, 1983, 58-137217
Int. Cl.³ B05D 1/18, 3/02
U.S. Cl. 427—397.7 12 Claims

1. A method for making a silicon dioxide coating on a surface of a substrate, which method comprises dipping the substrate in a treatment liquid obtained by adding boric acid to an



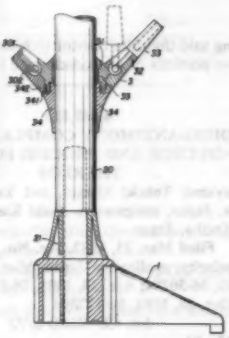
aqueous silicon dioxide-saturated solution of hydrosilicofluoric acid.

4,468,421

ARTIFICIAL CHRISTMAS TREE FOR QUICK FOLDING AND DISPLAY

Hai C. H. Wang, Chao-Chou Chen, Taiwan, assignor to Wong Fok Kee Co., Ltd., Ping-Tung Hsien, Taiwan

Filed Oct. 8, 1982, Ser. No. 433,539
Int. Cl.³ A47G 33/06
U.S. Cl. 428—8 5 Claims



1. An artificial Christmas tree for quick folding and display having a detachable base support and a tree-top cluster and twigs for display, comprising in combination;

a hollow trunk with reinforced ribs integrally formed along the inner wall of said hollow trunk;

a plurality of forked branch-coupling members fitted around said trunk at predetermined levels; and

straight joint means pivotally connected to said forked branch-coupling members for supporting the twigs, so that, by moving said forked branch-coupling members around said trunk, display patterns of said tree can be easily adjusted, and, by pivoting said joint means, said twigs may be folded against said trunk for easy storage and packing;

each said forked branch-coupling members comprising a lock ring having an annular flange and thread means at one end thereof;

a lower branch ring having at least one strut socket formed at the upper end and obliquely extending outwardly therefrom disposed around said trunk with the lower end abutting against the annular flange of said lock ring;

a fastening ring having an axial opening thereof fitted around said trunk with the lower and abutting against the upper end of said lock ring; and

an upper branch ring having at least one strut socket formed at the lower portion and obliquely extending outwardly therefrom corresponding to the positions of the strut socket of said lower branch ring; and thread means provided in the lower end fitted aroung said trunk by engaging the lower portion in the inner rim of said lower branch

ring and being connected to said lock ring through cooperating thread means, so that, by turning said lock ring, said branch-coupling members can easily be moved around said trunk for adjusting the display pattern of said tree as may be desired.

4,468,422

MATERIAL USEFUL AS ROOFING

Philip R. Siener, Jr., Greene, R.I., and Joseph H. McCusker, Raynham, Mass., assignors to Cooley Incorporated, Pawtucket, R.I.

Filed Feb. 9, 1981, Ser. No. 232,880
Int. Cl.³ B32B 3/00
U.S. Cl. 428—57 **6 Claims**

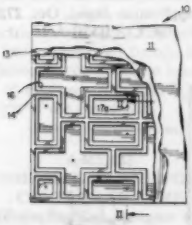
1. A roofing construction comprising
overlapping panels of sheet material comprising outer plastic sheets and an inner fabric there between wherein said fabric includes threads of low-elongation material adjacent to at least one edge of each panel,
said panels overlapping each other at a said one edge and being heat sealed together at overlapping portions.

4,468,423

INSULATING CELL ELEMENT AND STRUCTURES COMPOSED THEREOF

Arlie Hall, 4204 Rolling Hills Dr., Lexington, Ky. 40511

Filed Nov. 17, 1982, Ser. No. 442,404
Int. Cl.³ B32B 3/12
U.S. Cl. 428—72 **21 Claims**



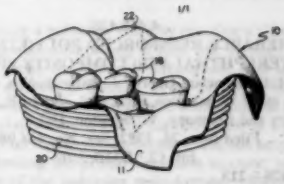
1. A thermal insulation structure comprising:
(a) a plurality of insulating cell elements contiguously disposed with respect to each other to form a monolithic structure,
(b) each of the insulating cell elements including a hermetically sealed shell defining a closed chamber having a volumetric space with a vacuum established in an amount sufficient to achieve a minimal heat conductivity through said space,
(c) each of the shells having a structural configuration effective to resist the outside pressure resulting when said vacuum is established in the closed chamber and being further effective to maintain said vacuum over a substantially unlimited period of time,
(d) each shell being separate and independent with respect to each other to form individual cell elements whereby the loss of vacuum in any single chamber does not adversely affect the vacuum conditions in a contiguously disposed insulating cell element,
(e) the monolithic structure having a heat transfer of down to at least about 0.050 Btu's per square foot at an overall thickness of about ¼ of an inch.

4,468,424

FOOD WARMER

Robert B. Cartwright, 4536 Park Blvd., San Diego, Calif. 92103

Filed Jan. 19, 1983, Ser. No. 458,938
Int. Cl.³ A47G 23/04
U.S. Cl. 428—103 **2 Claims**



1. A food warmer comprising:
a pair of dinner table napkin-sized sheets of pliant, heat-resistant cloth material that is suitable for wrapping around a portion of food on a dinner table;
means for joining the sheets together in face-to-face relation, including stitching along the peripheral edges and across the intermediate portions of the sheets to define a plurality of pockets between the sheets for containing a quantity of unbound particulate material and for insuring that the particulate material is disbursed over the areas of the sheets; and
a quantity of unbound particulate material disbursed over the areas of and between the sheets, the particulate material being vegetable matter with a sufficient thermal inertia to absorb heat from an oven used for cooking food and maintain apart from the oven an elevated temperature relative to the ambient temperature at the dinner table for a period of time so that the sheets and particulate material may be wrapped about a portion of food to keep the food warm during a meal;
wherein the food warmer can be preheated in an oven and then wrapped about a protion of food to keep the food warm on the table during a meal.

4,468,425

BOSS FORMATION USING LOW SURFACE ENERGY DAMS

Kenneth B. Gilleo, and Willard H. Kreibich, both of Sparta, Wis., assignors to Northern Engraving Corporation, Sparta, Wis.

Division of Ser. No. 250,070, Apr. 1, 1981, Pat. No. 4,409,264. This application Apr. 29, 1982, Ser. No. 372,917
Int. Cl.³ B32B 3/26; B05D 1/36
U.S. Cl. 428—172 7 Claims

1. An article comprising

a base including a non-porous surface having a surface energy greater than 30 dynes per centimeter and a pattern area on said surface,

a continuous, raised retaining means defining a boundary enclosing said pattern area, at least a portion of said retaining means being formed by a continuous strip of a hardened boundary-forming composition which is applied as a liquid and contains a low surface energy of about 5 to about 20 dynes per centimeter; and

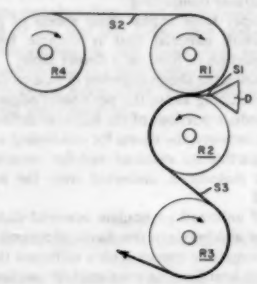
a solidified resin which is applied as a liquid, adheres to said surface and completely covers said pattern area at a depth greater than the height of said retaining means without extending over said retaining means.

4,468,426

ADHERABLE REINFORCED POLY(ETHYLENE TEREPHTHALATE) COMPOSITE SHEET

Edward Hatchadoorian; George J. Ostapchenko, and Harlan S. Young, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 24, 1982, Ser. No. 444,086
Int. Cl.³ B32B 7/02
U.S. Cl. 428—213 10 Claims



1. A thermoformable composite sheet having a base layer of fiber-reinforced amorphous poly(ethylene terephthalate) in which the fiber distribution is balanced side to side and a layer of an amorphous thermoplastic, adhesive copolyester material firmly attached to one side of said base layer, the thickness of said adhesive layer being at most about 35% of the thickness of said composite sheet.

4,468,427

BLENDS OF POLYAMIDE AND ETHYLENE VINYL ALCOHOL COPOLYMERS

Alfieri Degrassi, Pottsville, Pa.; William Sacks, Gillette, N.J.; John P. Sibilia, Livingston, N.J.; Abraham M. Kotliar, Westfield, N.J., and Charles D. Mason, Chatham Township, Morris County, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 319,165, Nov. 9, 1981, Pat. No. 4,427,825. This application Oct. 11, 1983, Ser. No. 540,984
Int. Cl.³ B32B 27/34, 27/32; C08L 29/02
U.S. Cl. 428—220 5 Claims

1. A laminate structure comprising a layer of an ethylene vinyl alcohol copolymer; and at least one adjacent layer of a heterogeneous melt blended composition consisting essentially of: a polyamide; and from 1 to 65% by weight of an ethylene vinyl alcohol copolymer having 15 to 65 mol percent ethylene, in the absence of plasticizer, wherein there are regions of ethylene vinyl alcohol copolymer having an average diameter of less than 500 angstroms in the polyamide, said composition having been processed at a temperature of from about 225° C. to 252° C. and being substantially free from crosslinking.

5. A film having a thickness of from about 0.5 mils to about 5 mils made from a heterogeneous melt blended composition consisting essentially of: a polyamide; and from 1 to 65% by weight of an ethylene vinyl alcohol copolymer haing 15 to 65 mol percent ethylene, in the absence of plasticizer, wherein there are regions of ethylene vinyl alcohol copolymer having an average diameter of less than 500 angstroms in the polyamide, said composition having been processed at a temperature of from about 225° C. to 252° C. and being substantially free from crosslinking.

4,468,428

HYDROPHILIC MICROFIBROUS ABSORBENT WEBS

Allen D. Early, Cincinnati, Ohio; David W. Cawlfield, Cleveland, Tenn.; Trevor Walker, Cincinnati, and Paul T. Weisman, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 1, 1982, Ser. No. 383,686
Int. Cl.³ D02G 3/00
U.S. Cl. 428—221 24 Claims

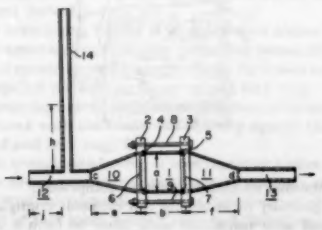
1. A fibrous absorbent web comprising at least about 50% of hydrophilic microfibers having a diameter of from about 0.01 microns to about 15 microns, said web having a density of from about 0.01 g/cm³ to about 0.15 g/cm³.

4,468,429

FIBER REINFORCED INORGANIC HARDENED BODY AND PROCESS FOR ITS PRODUCTION

Ryuichiro Takeda, Kamakura, and Naoaki Fujita, Tokyo, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Oct. 6, 1982, Ser. No. 433,144
Claims priority, application Japan, Oct. 27, 1981, 56/170753
Int. Cl.³ B32B 5/16
U.S. Cl. 428—283 24 Claims



1. A glass fiber reinforced inorganic hardened body com-

prising an inorganic hardened material and a glass fiber reinforcing material, said fiber is prepared by: (1) coating it with a hardenable liquid resin having an alkaline elusion rate of at most 15%, (2) immersing it in an alkaline solution, and (3) heating it from 50 to 250 degrees C. for a period sufficient to provide a fiber reinforcing material having a water permeability of from 5 to 27 l/min. and a volume reduction rate of at most 10%.

4,468,430

ASPHALT SHINGLE WITH GLASS FIBER MAT

Paul P. Ruede, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 23, 1982, Ser. No. 452,666

Int. Cl.³ B32B 9/00

U.S. Cl. 428—291 **6 Claims**

1. An asphalt shingle comprising a glass fiber mat coated with a modified asphalt composition including from 96% to 99.5% of asphalt and from 0.5% to 4% of random butadiene-styrene copolymer, based on the combined weights of the asphalt and copolymer.

4,468,431

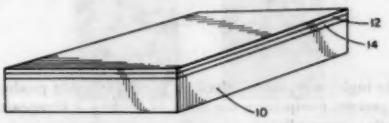
POLYIMIDE COMPOSITE

David W. Okey, Downers Grove, Ill., assignor to IML Corporation, Elk Grove Village, Ill.

Filed Nov. 17, 1983, Ser. No. 552,509

Int. Cl.³ B32B 3/26, 27/08

U.S. Cl. 428—317.7 **11 Claims**



1. A composite formed of (a) a core in the form of a foamed polyimide and (b) a backing layer bonded to one face of the core, said backing layer comprising a thin metal foil bonded to the core with a visco-elastic adhesive.

4,468,432

HIGH DIELECTRIC-CONSTANT FILM

Kazuo Matsukura, Nara; Kunio Murakami, Kyoto; Tsugio Nagasawa, Kyoto; Tomozo Sekiya, Kyoto, and Mituru Ueishi, Kyoto, all of Japan, assignors to Unitika, Ltd., Amagasaki, Japan

Filed Nov. 18, 1982, Ser. No. 442,811

Claims priority, application Japan, Nov. 18, 1981, 56-183874; Apr. 24, 1982, 57-69203; Jun. 17, 1982, 57-105098; Aug. 30, 1982, 57-152895

Int. Cl.³ B32B 5/16

U.S. Cl. 428—328 **13 Claims**

1. A high dielectric-constant film, comprising a thermoplastic polymer film having dispersed therein a ferroelectric substance having a dielectric constant of at least 10, the substance being present in an average about of 5% to 80% by weight based on the weight of the entire film.

4,468,433

ANTISTATIC COMPOSITION AND POLYESTER FIBER CONTAINING SAME

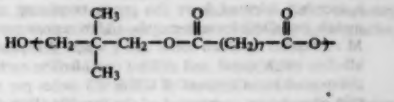
Victor R. Ben, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 26, 1982, Ser. No. 401,626

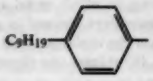
Int. Cl.³ D02G 3/00

U.S. Cl. 428—372 **3 Claims**

1. A static resistant terephthalate polyester fiber, containing between 1 and 6% by weight of a polymer composition comprising at least about 75 mol percent polyester units having the formula



and between 5 and 25 mol percent capped polyether units having the formula $-(CH_2-CH_2-O)_n-R$ wherein n is 8 to 20 and R is



or $-C_xH_{2x+1}$ where x is 12 to 16, said polymer composition having an inherent viscosity in the range of 0.15 to 0.35 and said polymer composition existing in the fiber as striations, said striations having a length to diameter ratio of at least about 20 to 1 and an average diameter in the range of about 0.5 to 1.5 microns.

4,468,434

DYED POLYESTER FIBER COMPOSITE STRUCTURE

Masaaki Sekimoto, Nishinomiya; Norihiro Minemura, Takatsuki; Togi Suzuki, and Kiyokazu Tsunawaki, both of Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 25, 1982, Ser. No. 411,347

Claims priority, application Japan, Aug. 25, 1981, 56-132039; Sep. 14, 1981, 56-143941; Feb. 22, 1982, 57-26064; Feb. 22, 1982, 57-26065; May 26, 1982, 57-87985

Int. Cl.³ D02G 3/00

U.S. Cl. 428—372 **35 Claims**

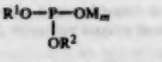
1. A dyed polyester fiber composite structure having an enhanced brilliance and color, produced by the process comprising:

(A) (1) forming a polyester resin by reacting a dicarboxylic acid component comprising at least one member selected from the group consisting of terephthalic acid and ester-forming derivative thereof as a principal ingredient thereof, with a glycol component comprising at least one alkylene glycol having 2 to 6 carbon atoms as a principal ingredient thereof to form a primary reaction mixture, and polycondensing the primary reaction mixture, in at least one stage of the polyester resin-forming procedure, admixing with the mixture at least one precursory pore-forming agent selected from the group consisting of:

(a) a mixture of at least one pentavalent phosphorus compound in an amount of 0.3 to 3 molar % based on the molar amount of said dicarboxylic acid component and at least one calcium compound which is in an amount of 1 mole to 1.7 moles per mole of said pentavalent phosphorus compound and which has not been preliminarily reacted with said pentavalent phosphorus compound;

(b) a mixture of at least one trivalent phosphorus compound in an amount of 0.3 to 3 mole % based on the molar amount of said dicarboxylic acid component, and at least one alkaline earth metal compound which is in an amount of 1 mole to 1.7 moles per mole of said trivalent phosphorus compound and which has not been preliminarily reacted with said trivalent phosphorus compound;

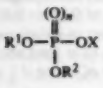
(c) a mixture of 0.3 to 3 molar % based on the molar amount of said dicarboxylic acid component, of at least one phosphorus compound of the formula (I):



(I)

wherein R^1 and R^2 represent, independently from each other, a member selected from the group consisting of hydrogen and monovalent organic radicals, M represents a member selected from the group consisting of alkali metals and alkaline earth metals, and m represents 1 when M represents an alkali metal and ½ when M represents an alkaline earth metal, and at least one alkaline earth metal compound in an amount of 0.5 to 1.2 moles per mole of said phosphorus compound of the formula (I) and which has not been preliminarily reacted with said phosphorus compound of the formula (I);

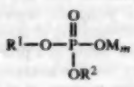
(d) a mixture of ingredients comprising (i) at least one member selected from the group consisting of isophthalic acid compounds having an alkali metal sulfonate radical and ester-forming derivatives thereof in an amount 0.5 to 10 molar % based on the molar amount of said dicarboxylic acid component, (ii) at least one phosphorus compound of the formula (II):



(II)

wherein R^1 and R^2 represent, independently from each other, a member selected from the group consisting of hydrogen and monovalent organic radicals, X represents a member selected from the group consisting of hydrogen, monovalent organic radicals and monovalent metal atoms, and n represents 0 or 1, in an amount of 0.3 to 3 molar % based on the molar amount of said dicarboxylic acid component, and (iii) at least one lithium compound in an amount such that the sum of the equivalent numbers of the metals contained in said ingredients (ii) and (iii) is in the range of from 2.0 times to 3.2 times the molar amount of the phosphorus compound in ingredient (ii), said ingredients (i), (ii), and (iii) not having been preliminarily reacted with each other; and

(e) a mixture of 0.5 to 3 molar % based on the molar amount of said dicarboxylic acid component, of at least one phosphorus compound of the formula (III):



(III)

wherein R^1 and R^2 represent, independently from each other, a member selected from the group consisting of hydrogen and monovalent organic radicals, M represents a member selected from the group consisting of alkali metals and alkaline earth metals, and m represents 1 when M represents an alkali metal and ½ when M represents an alkaline earth metal, and at least one alkaline earth metal compound in an amount of from 0.5 to 1.2 moles per mole of said phosphorus compound of the formula (III) and which has not been preliminarily reacted with said phosphorus compound of the formula (III); whereby said precursory pore-forming agent is converted into a pore-forming agent dispersed in fine particle form in the resultant polyester resin,

(2) melting spinning said resultant pore-forming agent-containing polyester resin to provide a polyester fiber in which fine particles of said pore-forming agent are dispersed,

(3) treating said polyester fiber with an aqueous alkali solution to an extent that at least 2% of the weight of said polyester fiber is dissolved in said aqueous alkali solution, whereby a number of pores are formed in said polyester fiber, and (4) dying said resultant porous polyester fiber; and

(B) coating said dyed porous polyester fiber with a composition comprising a polymeric material having a smaller refractive index than that of said porous polyester fiber.

4,468,435

PROCESS FOR THE PRODUCTION OF HIGHLY EXPANDED POLYOLEFIN INSULATED WIRES AND CABLES

Hiroshi Shimba; Fumio Suzuki, and Masao Yuto, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

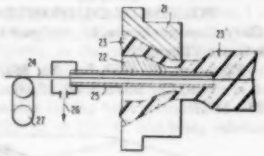
Continuation of Ser. No. 073,475, Sep. 7, 1979, abandoned, which is a continuation of Ser. No. 858,752, Dec. 8, 1977, abandoned, which is a continuation of Ser. No. 661,876, Feb. 27, 1977, abandoned, which is a division of Ser. No. 420,486, Nov. 30, 1973, abandoned. This application Jul. 1, 1981, Ser. No. 279,400

Claims priority, application Japan, Aug. 21, 1973, 48-92939; Sep. 12, 1973, 48-102212

The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.

Int. Cl.³ H01B *11/18;* **B32B** *27/06, 27/32, 15/08*

U.S. Cl. 428—383 **15 Claims**



1. In highly expanded polyolefin insulating cable produced by a process comprising the steps of feeding a composition consisting essentially of polyolefin, a nucleating agent and a volatile liquid as a blowing agent to an extruder onto an inner conductor passing through said extruder to cover the outer periphery of said inner conductor thereby forming an insulation layer of a highly expanded foam consisting essentially of polyolefin, the improvement wherein said highly expanded foam consisting essentially of polyolefin has a foaming ratio in excess of 2.5 times (60% expansion degree) and wherein said process includes the step of applying an adhesive layer onto said inner conductor which has been preheated prior to said applying to increase the adhesive strength between said highly expanded polyolefin insulation layer and said inner conductor prior to forming said highly expanded polyolefin insulated layer onto said adhesive layer on said inner conductor.

4,468,436

MAGNETIC RECORDING MATERIAL

Tsutomu Okita, and Kiritani Masataka, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 23, 1982, Ser. No. 452,555

Int. Cl.³ B05D *3/06*

U.S. Cl. 428—423.3 **15 Claims**

1. A magnetic recording material produced by a process comprising the steps of:

providing a subbing layer on a surface of a support base, the subbing layer comprising a compound having an unsaturated bond polymerizable upon irradiation with electron beams;

coating a composition on the subbing layer, the composition comprising (a) a compound having an unsaturated bond polymerizable upon irradiation with electron beams, (b) an organic solvent capable of dissolving the compound, and (c) a ferromagnetic powder;

irradiating the subbing layer and coated composition with sufficient electron beam irradiation to cause polymeriza-

tion and hardening of the subbing layer compound and the compound (a) containing the ferromagnetic powder (c).

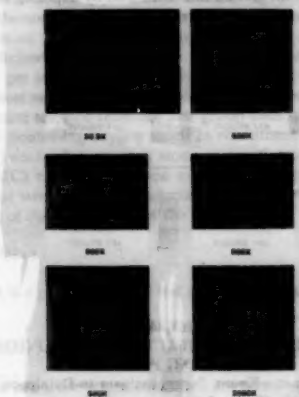
4,468,437
DEPOSITED FILMS WITH IMPROVED MICROSTRUCTURES

James W. Patten; Ronald W. Moss, and Edwin D. McClanahan, all of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation of Ser. No. 131,922, Mar. 21, 1980, Pat. No. 4,336,118. This application Feb. 22, 1982, Ser. No. 350,738

Int. Cl.³ B22F 7/08; C23C 13/00

U.S. Cl. 428—553 17 Claims



1. A coated substrate comprising:

a substrate having a three-dimensional surface and a physical vapor deposited solid coating covering said surface;

said surface including at least first and second surface portions mutually oriented so that parallel lines of sight intersect the first portion at about a right angle and the second portion at an acute angle sufficient to produce geometric shadowing thereon;

said coating having a substantially uniform microstructure over said surface with any columnar growth defects therein due to geometric shadowing being limited in length to less than the thickness of the coating;

said coating being substantially free of microstructural modifications caused by heat treatment.

2. A coated substrate according to claim 1 in which the coating is free of columnar growth defects.

3. A coated substrate according to claim 1 is a concavo-convex surface, the coating having a microstructural through-porosity of less than the thickness of the coating over the entirety of the surface.

17. A coated substrate comprising a substrate having a coating which includes:

a first physical vapor deposited coating initially deposited over first and second surface portions of a substrate, at a high angle of incidence on the first portion and a low angle of incidence on the second portion, and partially removed so as to leave a first residual coating covering only the first surface portion; and

a second physical vapor deposited coating deposited and partially removed in essentially the same manner as the first coating but offset therefrom along the substrate surface to provide a second residual coating covering the second surface portion and overlapping the first residual coating.

4,468,438
GARNET EPITAXIAL FILMS WITH HIGH CURIE TEMPERATURES

Stuart L. Blank, Madison, and Virendra V. S. Rana, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 7, 1981, Ser. No. 328,384

Int. Cl.³ B32B 9/04; G11C 19/08

U.S. Cl. 428—692 3 Claims

1. A process for growing a garnet film on a substrate comprising the steps of immersing said substrate in a growth melt, growing said film on said substrate, and removing said substrate from said melt characterized in that said process includes the step of producing said growth melt by forming a molten composition containing calcium and vanadium such that the mole ratio of said vanadium to said calcium is above 2.0, wherein said garnet film comprises a composition represented by the formula $\{RE_{3-x}Ca_x\}[M_{5-y}V_y]O_{12}$ where y is in the range 0.50 to 0.65, where $0<x<3$ and wherein said composition is essentially neutral in charge.

4,468,439
BATTERY LOADING DEVICE

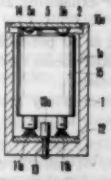
Tsunemasa Ohara, Tokyo, and Masayuki Suzuki, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,405

Claims priority, application Japan, Oct. 15, 1981, 56-153940[U]; Nov. 10, 1981, 56-180203

Int. Cl.³ H01M 2/20

U.S. Cl. 429—1 4 Claims



1. A power source battery loading device to be built in appliances having an electrical circuit comprising:

a battery loading chamber for selectively loading;

a plural number of cylindrical unit batteries to be loaded in parallel and connected in series;

a combined type battery having the same voltage as that of the plural number of the cylindrical unit batteries connected in series, being shaped asymmetrical in section and provided with a pair of projecting electrodes at the one end surface;

said battery loading chamber being similar to the one body type battery in section, having an opening through which the one body type battery can be loaded and spring-shaped contacts, on the bottom of the chamber to be brought in contact with the electrodes of the cylindrical unit batteries and those of the one body type battery so as to supply current to the electrical circuit; and

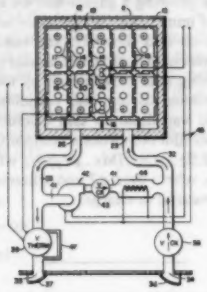
an operable battery chamber cover for covering the opening of the battery loading chamber, said cover having conductive pieces provided on the internal surface to be brought in contact with the electrodes of the plural number of the cylindrical unit batteries so as to connect the batteries in series and an engaging member for holding the cover in the closed state.

4,468,440

AIR HEATING AND COOLING SYSTEM FOR AIRCRAFT BATTERIES

John M. Evjen, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed May 21, 1982, Ser. No. 380,578
Int. Cl.³ H01M *14/00*
U.S. Cl. 429—8 **12 Claims**



1. A heating and cooling system for an aircraft battery, said system comprising:

a battery case for holding a plurality of cells, said cells being spaced from one another to provide at least one air passageway between each of said cells, said passageway having first and second ends, said battery case also defining an air inlet plenum opening to the first end of said air passageway and an air exhaust plenum opening to the second end of said air passageway;

air inlet means for providing air to said inlet plenum and air exhaust means for exhausting air from said exhaust plenum;

means for providing an air pressure differential to circulate air from said air inlet means through said battery case to said air exhaust means;

air heating means operatively mounted with said battery case to heat air prior to said air passing to said air inlet means; and

means responsive to the temperature in said battery case to alter the air flow of said system from a flow through system to a recirculating system, said means recirculating air from said air exhaust means through said air heating means to said air inlet means when the temperature in the battery case drops to an undesirably low level.

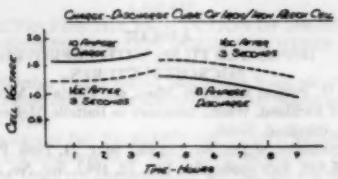
4,468,441

SEPARATOR MEMBRANES FOR REDOX-TYPE ELECTROCHEMICAL CELLS

Vincent F. D'Agostino, Huntington, and Joseph Y. Lee, Lake Grove, both of N.Y., assignors to RAI Research Corp., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 307,588, Oct. 1, 1981, Pat. No. 4,414,090. This application Sep. 28, 1982, Ser. No. 425,973
Int. Cl.³ H01M *4/36, 2/16;* C25B *9/00, 13/08*
U.S. Cl. 429—105 **10 Claims**

1. In an improved redox electrochemical cell incorporating two chemically-inert electrodes of opposite polarity, at least one aqueous acidic electrolyte, and a separator membrane between the adjacent electrodes, the improvement comprising an anion exchange separator membrane formed by grafting a polyolefin film to the extent of 5–200% with one or more vinyl substituted monomers via gamma irradiation and subsequently



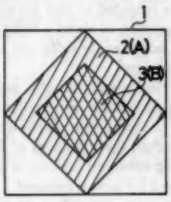
impregnating the grafted film with iron by exposing said film to an aqueous solution of ferric ion.

4,468,442

METHOD FOR MANUFACTURING HALF-TONE PRINTING PLATES

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jul. 30, 1982, Ser. No. 403,851
Claims priority, application Japan, Aug. 11, 1981, 56-126307
Int. Cl.³ G03B *27/72, 27/76, 72/32, 27/42*
U.S. Cl. 430—30 **4 Claims**



1. A method for making half-tone printing plates, the method comprising a step of controlling individually each of plural fine lighting points disposed above recording films transversely of the scanning direction of light beams in such a manner as to switch on and off the lighting points in accordance with such image signals or dot signals corresponding thereto that originate from an original picture to be recorded, characterized in that a unit area corresponding to a single dot area is divided into plural fine network patterns wherein the patterns are different from each other in their tone reproduction characteristics and are respectively composed of many divisional elements defined so as not to overlap each other, and that the light beams are controlled to be switched on and off according to a reference signal corresponding to one of said sequential image signals and also according to other signals from said fine network patterns wherein the latter signals are defined to alter in correspondence with such positions in the single dot unit area that are to be exposed to said light beams.

4,468,443

PROCESS FOR PRODUCING PHOTOCONDUCTIVE MEMBER FROM GASEOUS SILICON COMPOUNDS

Isamu Shimizu, Yokohama; Kyosuke Ogawa; Eiichi Inoue, both of Tokyo, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1982, Ser. No. 354,898

Claims priority, application Japan, Mar. 12, 1981, 56-36267; Mar. 16, 1981, 56-37441; Mar. 16, 1981, 56-37442; Apr. 21, 1981, 56-60153; Apr. 21, 1981, 56-60154; Apr. 21, 1981, 56-60155; Apr. 21, 1981, 56-60156; Apr. 21, 1981, 56-60157; Apr. 21, 1981, 56-60158

Int. Cl.³ G03G *5/082*

U.S. Cl. 430—60 **20 Claims**

1. A process for producing a photoconductive member, which comprises forming a photoconductive layer on a substrate for formation of a photoconductive layer by introducing starting substances for formation of a photoconductive layer under gaseous state into a deposition chamber maintained under a desired reduced pressure and exciting discharging under the gas atmosphere of said starting substances, characterized in that said starting substances are constituted of at least one substance selected from the first group consisting of substances(O) containing oxygen atoms as constituent atom, substances(N) containing nitrogen atoms as constituent atom and substances(C) containing carbon atoms as constituent atom, and at least two compounds selected from the second group consisting of the compounds of the formula:

$$Si_nH_{2n+2} \quad (A)$$

wherein n is a positive integer and the compounds of the formula:

$$Si_mH_lX_k \quad (B)$$

wherein m and k are positive integers, l is 0 or a positive integer, $l+k=2m+2$, and X represents a halogen atom, n and m being called "order number" hereinafter, and said at least two compounds selected from the second group consisting of the compounds represented by the formulas (A) and (B) to be introduced into said deposition chamber being controlled in amounts such that the proportion of the total of high order compounds is at least 1 vol.% based on the total of the minimum order compounds, the minimum order compound being one whose order number is the minimum among order numbers of said at least two compounds, the high order compound being one whose order number is higher than the order number of the minimum order compound wherein at least 0.1 vol.% of (O), (N), or (C) based on compounds selected from (A) and (B).

4,468,444

PYRYLIUM-SENSITIZED LEUCO BASE PHOTOCONDUCTIVE COMPOSITIONS AND ELEMENTS CONTAINING NAPHTHALENE BIS-DICARBOXIMIDE COMPOUNDS

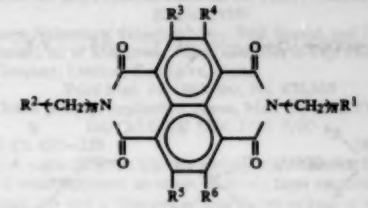
Lawrence E. Contois, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1983, Ser. No. 468,830

Int. Cl.³ G03G *5/06*

U.S. Cl. 430—72 **7 Claims**

1. A photoconductive composition comprising at least one arylalkane leuco base photoconductor, a 4-aminobenzo[b-]pyrylium or 4-aminobenzo[b]-thiopyrylium sensitizer and a 1,4,5,8-naphthalene bis-dicarboximide compound in effective amounts to reduce the leuco base color shift of said composition, said naphthalene bis-dicarboximide having the structure:



wherein:

R^1 and R^2, which may be the same or different, represent aryl, or aryl substituted with alkyl, alkoxy, perfluoroalkyl or perfluoroalkoxy groups having 2 to 20 alkyl carbon atoms; sulfonyl; sulfone; sulfonamide; nitrile; or nitro groups;

R^3, R^4, R^5 and R^6, which may be the same or different, represent hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, or halogen;

and n is 0 to 3.

4,468,445

ELECTROPHOTOGRAPHIC MIXTURE CONTAINING TONER PARTICLES AND COATED CARRIER PARTICLES

Paul P. Kelly, 39134 Ebbets, Newark, Calif. 94560, and Trudy A. Bochantin Connor, 65 Adam Way, Atherton, Calif. 94025

Filed Jan. 31, 1983, Ser. No. 462,142

Int. Cl.³ G03G *9/00*

U.S. Cl. 430—107 **10 Claims**

1. An electrophotographic developer composition comprising coated carrier particles, together with toner particles, the concentration of the toner particles being 1.5–3.5% by weight of the carrier particles, the coating on said carrier particles comprising a thermoplastic copolymer of epichlorohydrin and 2,2-bis-(p-hydroxyphenyl) propane or a hydroxyalkyl ether derivative thereof and said coating comprising from 0.1 to 1% by weight of said carrier particles.

4,468,446

ELECTROSTATOGRAPHIC ENCAPSULATED TONER MATERIAL IMPROVED IN POWDER CHARACTERISTICS

Takeshi Mikami, and Noriyuki Hosoi, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 30, 1982, Ser. No. 432,061

Claims priority, application Japan, Oct. 16, 1981, 56-165266

Int. Cl.³ G03G *13/20, 9/16*

U.S. Cl. 430—138 **7 Claims**

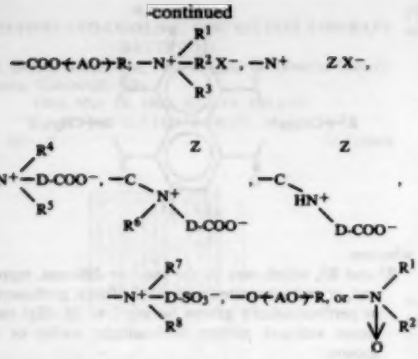
1. An electrostatographic toner material comprising encapsulated toner particles having an average particle size in the range from about 0.5 to about 1,000 microns, in which the toner particle comprises a pressure fixable adhesive core material containing a colorant and a pressure rupturable shell enclosing the core material, the outer surface of the shell being provided with an organofluoro compound having the formula (I)

$$(Cf)-(Y)_n \quad (I)$$

in which (Cf) is a group of n valency, containing both of at least 3 fluorine atoms and at least 3 carbon atoms, n is 1 or 2, and (Y) is

$$-COOM,\ -SO_3M,\ -O-SO_3M,\ -\overset{\overset{O}{\|}}{P}-(OM)_2,$$

-continued



in which

M is a hydrogen atom, a cation such as an alkali metal an alkaline earth metal or a quaternary ammonium group, or a hydrocarbon residue containing 1–18 carbon atoms;

—AO— is a poly(alkylene oxide) selected from the group consisting of polyoxyethylene, polyoxypropylene, and a block copolymer of ethylene oxide and propylene oxide, in which the polymerization degree ranges from 2 to 100;

R is an alkyl group having 1–18 carbon atoms or an aryl group having 6–18 carbon atoms;

R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 are the same or different and each represents an alkyl or hydroxyalkyl group having 1–4 carbon atoms;

X is a halogen atom or R-O-SO_2-O^- group in which R has the same meaning as defined above;

Z is a group of atoms for constituting a 5- or 6-membered ring in cooperation with the N atom; and

D is an alkylene group having 1–5 carbon atoms.

4,468,447

PHOTOSENSITIVE BISAZIDE COMPOSITION FOR DRY DEVELOPMENT

Wataru Kanai, Samukawa, Japan, assignor to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

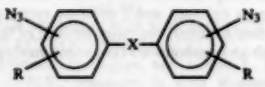
Continuation of Ser. No. 248,325, Mar. 27, 1981, Pat. No. 4,388,397. This application Mar. 4, 1983, Ser. No. 472,004

Claims priority, application Japan, Mar. 29, 1980, 55-39673

Int. Cl.³ G03C *1/71, 1/70, 1/60*

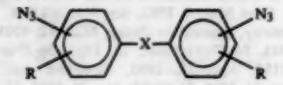
U.S. Cl. 430—197 **12 Claims**

1. In a photosensitive composition for dry development comprising a polymer and a subliming bisazide compound as a photocuring agent, the improvement comprising: (a) selecting as the polymer, a copolymer of glycidyl methacrylate having a molecular weight from tens of thousands to two million; and (b) selecting as the subliming bisazide compound, a photocuring-effective amount of subliming bisazide compounds represented by the general formula:



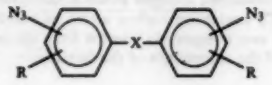
where R is a hydrogen or a halogen atom and X is an oxygen atom, a carbonyl group, a methylene group, a sulfur atom, a disulfide group or a sulfone group.

6. In a photosensitive composition for dry development comprising a polymer and subliming bisazide compound as a photocuring agent, the improvement comprising: (a) selecting the polymer from at least one member selected from the group consisting of a polyphenyl vinyl ketone homopolymer and a copolymer of a vinyl ketone, the polymer having a molecular weight of from tens of thousands to two million; and (b) selecting a photocuring-effective amount of the subliming bisazide compound from subliming bisazide compounds represented by the general formula:



where R is a hydrogen or a halogen atom and X is an oxygen atom, a carbonyl group, a methylene group, a sulfur atom, a disulfide group or a sulfone group.

8. In a photosensitive composition for dry development comprising a polymer and a subliming bisazide compound as a photocuring agent, the improvement comprising: (a) selecting the polymer from at least one member selected from the group consisting of a vinyl ketone homopolymer and a copolymer of vinyl ketone, the polymer having a molecular weight of from tens of thousands to two million; and (b) selecting a photocuring-effective amount of the subliming bisazide compound from subliming compounds represented by the general formula:



where R is a hydrogen or a halogen atom and X is a disulfide group.

4,468,448

PHOTOGRAPHIC PRODUCTS AND PROCESSES

Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 2, 1983, Ser. No. 500,366

Int. Cl.³ G03C *1/40, 7/00, 5/54*

U.S. Cl. 430—222 **18 Claims**

8. A photographic product comprising a photosensitive element comprising a plurality of layers including a support; a silver halide emulsion in a layer on said support; and in a layer on the same side of said support as said silver halide emulsion, a colorless precursor of a preformed image dye substituted with a moiety comprising a 1,3-sulfur-nitrogen group that undergoes cleavage in the presence of silver ions and/or soluble silver complex, said moiety maintaining said precursor in its colorless form until said 1,3-sulfur-nitrogen group undergoes said cleavage, said 1,3-sulfur-nitrogen group possessing a carbon atom in the 2-position intermediate said sulfur and nitrogen atoms.

11. A photographic product as defined in claim 8 wherein said image dye provided by said colorless precursor is diffusable in aqueous alkaline solution and said product includes an image-receiving layer so positioned as to be capable of receiving by diffusion said imagewise distribution of said diffusible dye.

4,468,449

PHOTOGRAPHIC PRODUCTS AND PROCESSES

Roberta R. Arbree, Nashua, N.H.; James W. Foley, Andover, and Frank A. Meneghini, Arlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 2, 1983, Ser. No. 500,391

Int. Cl.³ G03C *1/40, 7/00, 5/54, 1/10*

U.S. Cl. 430—222 **25 Claims**

8. A photographic product comprising a photosensitive element comprising a plurality of layers including a support; a silver halide emulsion in a layer on said support; and in a layer on the same side of said support as said silver halide emulsion, a colorless precursor of a preformed image dye substituted

with a moiety containing a thiazolidinyl group, said thiazolidinyl group (a) being capable of undergoing cleavage in the presence of silver ions and/or soluble silver complex and (b) possessing a substituent on the carbon atom in the 2-position that undergoes a β-elimination reaction following the cleavage of said thiazolidinyl group, said moiety maintaining said precursor in its colorless form at least until said thiazolidinyl group undergoes said cleavage.

11. A photographic product as defined in claim 8 wherein said image dye provided by said colorless precursor is diffusible in aqueous alkaline solution and said product includes an image-receiving layer so positioned as to be capable of receiving by diffusion said imagewise distribution of said diffusible dye.

4,468,450

PHOTOGRAPHIC PRODUCTS AND PROCESSES

Frank A. Meneghini, Arlington, and Paul S. Palumbo, West Newton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 2, 1983, Ser. No. 500,414
Int. Cl.³ G03C *1/10, 1/40, 5/54, 7/00*
U.S. Cl. 430—222 **25 Claims**

9. A photographic product comprising a photosensitive element comprising a plurality of layers including a support; a silver halide emulsion in a layer on said support; and in a layer on the same side of said support as said silver halide emulsion, a colorless precursor of a preformed image dye substituted with a moiety containing a thiazolidinyl group, said thiazolidinyl group (a) being capable of undergoing cleavage in the presence of silver ions and/or soluble silver complex and (b) possessing a substituent on the carbon atom in the 2-position which upon cleavage of said thiazolidinyl group undergoes a β-elimination reaction followed by an intramolecularly accelerated nucleophilic displacement reaction, said moiety maintaining said precursor in its colorless form at least until said thiazolidinyl group undergoes said cleavage.

12. A photographic product as defined in claim 9 wherein said image dye provided by said colorless precursor is diffusible in aqueous alkaline solution and said product includes an image-receiving layer so positioned as to be capable of receiving by diffusion said imagewise distribution of said diffusible dye.

4,468,451

PHOTOGRAPHIC PRODUCTS AND PROCESSES

James W. Foley, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 2, 1983, Ser. No. 500,415
Int. Cl.³ G03C *1/40, 5/54, 1/10, 7/00*
U.S. Cl. 430—222 **25 Claims**

9. A photographic product comprising a photosensitive element comprising a plurality of layers including a support; a silver halide emulsion in a layer on said support; and in a layer on the same side of said support as said silver halide emulsion, a colorless precursor of a preformed image dye substituted with a moiety containing a 1,3-sulfur-nitrogen group, said 1,3-sulfur-nitrogen group (a) being capable of undergoing cleavage in the presence of silver ions and/or soluble silver complex and (b) possessing an amide substituent on the carbon atom in the 2-position which upon cleavage of said 1,3-sulfur-nitrogen group undergoes an intramolecularly accelerated cleavage reaction, said moiety maintaining said precursor in its colorless form at least until said 1,3-sulfur-nitrogen group undergoes said cleavage.

12. A photographic product as defined in claim 9 wherein said image dye provided by said colorless precursor is diffusible in aqueous alkaline solution and said product includes an image-receiving layer so positioned so to be capable of receiving by diffusion said imagewise distribution of said diffusible dye.

4,468,452

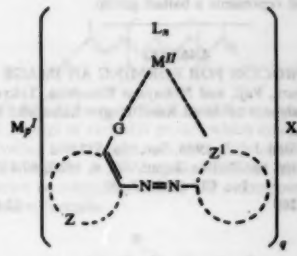
COLOR DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENTS

Shigeru Nakamura; Shigetoshi Ono; Seiji Suzuki, and Hirohisa Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Company, Limited, Kanagawa, Japan

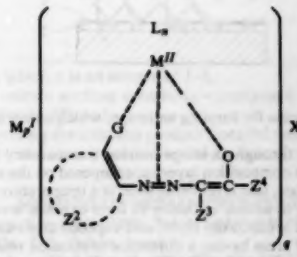
Filed Mar. 24, 1983, Ser. No. 478,568
Claims priority, application Japan, Mar. 24, 1982, 57/46540
Int. Cl.³ G03C *5/54, 1/40, 7/00*
U.S. Cl. 430—223 **18 Claims**

1. A color diffusion transfer photographic element comprising at least a support, an image-receiving layer associated with a metal ion and a layer containing a dye-providing material associated with a light-sensitive silver halide emulsion, wherein said dye-providing material is a metal chelate compound represented by the following general formula (I) or (II):

(I)

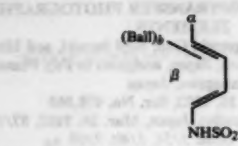


(II)



wherein M^J represents a monovalent, divalent, or trivalent cation; X represents a monovalent, divalent, or trivalent anion; Z and Z^2 each represents an aromatic carbon ring nucleus or heterocyclic ring nucleus having 5 to 7 carbon atoms; G represents a chelating group; Z^1 represents an aromatic carbon ring nucleus or heterocyclic nucleus composed of 5 to 7 carbon atoms; said nucleus having (a) a nitrogen atom, or (b) a carbon atom bonded to a chelating group at the position adjacent to the position bonded to the azo group; Z^3 represents an electron attractive group; Z^4 represents an alkyl group, an aryl group, or a substituted amino group; L represents a ligand including a dye ligand; M^{II} represents a metal ion weakly coordinated to the dye ligand moiety as compared with the metal ion associated with the image-receiving layer; p, r and n each is an integer of 0 to 5 and q is 1, 2 or 3, with the proviso that the charges of the total chelate dyes become zero, and wherein the chelate compound further contains (1) a carrier component losing the diffusible property or (2) a ballasted carrier capable of releasing a diffusible dye when the silver halide emulsion is developed under an alkaline condition, whereby the M^{II} ion as chelate metal is substituted by the metal ion associated with the image-receiving layer during processing of the element.

11. The color diffusion transfer photographic element as claimed in claim 1, wherein the carrier component is bonded to Z or Z^1 in general formula (I) and is represented by the following formula:



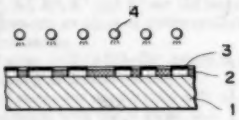
wherein β represents a non-metallic atomic group necessary for forming a benzene ring; α represents a group shown by $-OG^1$ or $-NHG^2$ (wherein G^1 represents a hydrogen atom or a group forming a hydroxyl group by decomposition and G^2 represents a hydrogen atom, an alkyl group having 1 to 22 carbon atoms, or a hydrolyzable group); b is 0, 1, or 2; said b is, however, 1 or 2 when α is a group shown by $-OG^1$ or when α is shown by $-NHG^2$ and G^2 is a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, or a hydrolyzable group; and Ball represents a ballast group.

4,468,453

DRY PROCESS FOR FORMING AN IMAGE

Shobei Nakamura, Fuji, and Nobuyasu Kinoshita, Tokyo, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 5, 1983, Ser. No. 511,042
Claims priority, application Japan, Jul. 6, 1982, 57-117403
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—269 **12 Claims**



1. A dry process for forming an image, which comprises the steps of:

(1) exposing through an image-bearing transparency a photosensitive composition layer superimposed on the surface of a substrate, said layer being solid at a temperature of 50° C. or less, to actinic radiation to form exposed areas and unexposed areas in the layer, said exposed areas and said unexposed areas having a difference in abrasion resistance therebetween which difference is sufficient to allow the exposed areas or unexposed areas to be selectively removed by an abrasive force; and

(2) blowing an abrasive material against the layer to selectively remove the exposed areas or the unexposed areas, whichever is relatively low in abrasion resistance, thereby forming an image corresponding to that of the image-bearing transparency in the layer.

4,468,454

ANTIFOGGANT PROCESS

Clyde P. Brown, Pisgah Forest, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 10, 1983, Ser. No. 503,296
Int. Cl.³ G03C *1/02, 1/06*
U.S. Cl. 430—569 **5 Claims**

1. A process of producing a silver halide-containing photographic film wherein a negative-working silver halide emulsion is, inter alia, chemically sensitized and digested, characterized in that a fog-reducing and/or age-stabilizing amount of a bromine- or chlorine-substituted organic compound is added to said negative-working silver halide emulsion at any stage of preparation prior to the conclusion of digestion, or of chemical sensitization the aforesaid additive being a member selected from the group consisting of m-nitrobenzyl chloride, o-nitrobenzyl chloride, p-nitrobenzyl chloride, 2-chloro-4-nitrobenzyl chloride, 2-chloro-5-nitrobenzyl chloride, 4-chloro-2-nitrobenzyl chloride, 4-chloro-3-nitrobenzyl chloride, 4,5-dichloro-5-nitropyrimidine, 5-chloro-2-(trichloromethyl) benzimidazole, 2-chloro-3-nitropyridine, 2-amino-3,5-dichloropyridine, p-nitrobenzyl thiocyanate, chloro-(4-nitrophenyl) methane, 2-(p-nitrobenzyl) thiopyridinium bromide, 4'-chloro-4'-(4-nitro-phenyl) butyric acid ethyl ester, 3-bromo-3-(4-nitrophenyl)-propionic acid, and 4-chloro-4-(p-nitrophenyl)-butyric acid.

4,468,455

CELL CULTURE CONTROL

Thomas R. Hopkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 2, 1980, Ser. No. 212,169
Int. Cl.³ C12Q *3/00*; C12M *1/34*
U.S. Cl. 435—3 **16 Claims**

1. A cell culture process comprising

(a) contacting cells with liquid culture medium under growth conditions to allow said cells to metabolize and grow,

(b) adding a given amount of an additive to said medium which additive is toxic for the culture above a certain concentration, and determining the change of metabolic activity of said cells occurring after said adding,

(c) repeating step b a plurality of times but each time only if at least a minimum change of metabolic activity was determined in the previous step b.

4,468,456

MEDIUM FOR DIFFERENTIATING *STREPTOCOCCUS MUTANS*

John L. Deyloff, Dover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 29, 1982, Ser. No. 362,805
Int. Cl.³ C12Q *1/14, 1/04*; C12N *1/20*; C12R *1/46*
U.S. Cl. 435—36 **47 Claims**

1. A method for the selective identification of *Streptococcus mutans* comprising:

A. preparing a medium consisting essentially of:
1. tryptone-glucose extract agar;
2. dibasic potassium phosphate;
3. monobasic potassium phosphate;
4. yeast extract;
5. agar;
6. a color indicator for said bacteria; and
7. from about 1% to about 15% sucrose;

B. placing a quantity of said medium in a receptacle to form a first basal layer;

C. permitting said first basal layer to solidify;

D. preparing an overlayer agar coating comprising a mixture of a suspension of calcium phosphate, and a sterile quantity of said medium;

E. disposing a quantity of said overlayer agar coating on said first basal layer to form a product, wherein the amount of calcium phosphate is sufficient to detect production of acid by *Streptococcus Mutans*.

F. drying the product to form a culture plate ready for use;

G. inoculating and incubating under conditions suitable for growth the culture plate with a sample to be determined; and

H. Observing the incubated plate to identify *Streptococcus Mutans*.

4,468,457

METHOD FOR PRODUCING A CSAP TRYPTIC PEPTIDE AND ANTI-CSAP ANTIBODIES

Milton D. Goldenberg, and Dan Shochat, both of Lexington, Ky., assignors to David M. Goldenberg, Short Hills, N.J.

Filed Jun. 1, 1981, Ser. No. 269,115

Int. Cl.³ C12P *21/00*; C12N *9/00*; A61K *39/00, 39/395*

U.S. Cl. 435—69 19 Claims

1. A method for producing a purified, substantially homogeneous immunologically active tryptic peptide having colon-specific antigen-p (CSAp) antigenic activity, comprising the steps of:

(a) enzymatically partially digesting a native CSAp fraction, having a molecular weight of at least about 4 million, with trypsin for 1–8 hours, and terminating the digestion with a trypsin inhibitor, the efficacy thereof being monitored by determining the substantial absence of residual protease activity; and

(b) fractionating the partial tryptic digest, and recovering at least one substantially homogeneous fraction containing a tryptic peptide having CSAp antigenic activity, having a molecular weight of about 120,000 and having substantially no absorbance at 280 nm.

4,468,458

TWO-FUNCTIONAL-GROUP-CONTAINING TERPENOIDS, PROCESSES FOR THE PREPARATION OF THE SAME, AND ANTI-ULCER AGENTS CONTAINING THE SAME

Akio Sato, Yatabe; Kenji Nakajima, Sakuramura; Yoshimasa Takahara, Narashimo; Shizumasa Kijima, Niiza; Noriaki Kuwana, Aichi; Shinya Abe, Kawagoe, and Kouzi Yamada, Tokyo, all of Japan, assignors to Eisai Co., Ltd. and Director General of the Agency of Industrial Science and Technology, both of Tokyo, Japan

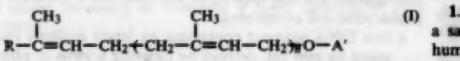
Division of Ser. No. 221,163, Dec. 29, 1980, Pat. No. 4,338,251. This application Mar. 22, 1982, Ser. No. 360,519

Claims priority, application Japan, Jan. 12, 1980, 53-2395

Int. Cl.³ C12P *7/64*

U.S. Cl. 435—134 7 Claims

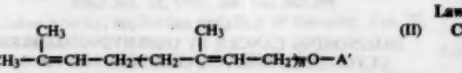
1. A process for the preparation of a compound having the formula (I):



(I)

in which n is an integer of from 1 to 5, A′ is 2-tetrahydropyranyl, benzyl, methoxymethyl or methoxyethoxymethyl, and R is hydroxymethyl, formyl or carboxyl, which comprises the steps of:

cultivating Nocardia BPM 1613, FERM-P No. 1609, in a nutritive culture medium in the presence of a compound having the formula (II):



(II)

in which n and A′ have the same meanings as defined above, whereby said microorganism utilizes said compound of the general formula (II) as a carbon source and oxidizes said compound (II), thereby converting said compound (II) into said compound (I); and

recovering the thus-produced compound having the general formula (I).

4,468,459

PROCESS FOR THE PREPARATION OF POLYPRENYL KETONE DERIVATIVES

Akio Sato, Yatabemachi; Kenji Nakajima, Sakuramura; Yoshimasa Takahara, Narashino; Shizumasa Kijima, Niiza; Isao Yamatsu, Kawaguchi; Kouichi Suzuki, Kakamigahara; Takeshi Suzuki, Abiko, and Toshihiko Nakamura, Tokyo, all of Japan, assignors to Eisai Co., Ltd. and Director General of the Agency of Industrial Science and Technology, both of Tokyo, Japan

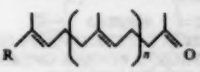
Division of Ser. No. 312,068, Oct. 16, 1981,. This application Dec. 3, 1982, Ser. No. 446,817

Claims priority, application Japan, Oct. 23, 1980, 55-148831

Int. Cl.³ C12P *7/40, 7/26*

U.S. Cl. 435—136 2 Claims

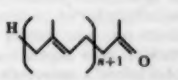
1. A process for the preparation of a polyprenyl ketone derivative having the general formula:



(I)

in which n is an integer of 1–5, and R represents a hydroxymethyl, formyl or carboxyl group, which comprises:

cultivating a microorganism belonging to the genus Nocardia identified as BPM 1613, FERM-P No. 1609, which shows an oxidizing activity on a compound having the general formula:



(II)

in which n is an integer of 1–5,

in a culture medium containing a compound of the general formula (II); and

recovering the oxidized product from the cultured medium.

4,468,460

METHOD OF HUMAN CELL CULTURE

Shoichiro Kumamoto, Oita, Japan, assignor to Chlorella Industry Co., Ltd., Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,847

Claims priority, application Japan, Jun. 15, 1981, 56-91733

Int. Cl.³ C12N *5/00*; C12R *1/91*

U.S. Cl. 435—240 17 Claims

1. A method for culturing human cells comprising culturing a sample of human cells in a nutritive culture medium for human cells, said culture medium containing an amount of an extract of microalgae sufficient to cause human cell multiplication, wherein said extract comprises substances having molecular weights in the range of 1,000 to 1,000,000, which substances include sugars, proteins, polysaccharides and nucleic acids.

4,468,461

MICROBIOLOGICAL REMOVAL OF CHROMATE FROM CONTAMINATED WASTE WATER

Lawrence H. Bopp, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,494

Int. Cl.³ C12N *1/20*; C12P *3/00*; C12R *1/39*

U.S. Cl. 435—253 9 Claims

1. A biologically pure culture of a strain of *Pseudomonas fluorescens* having the identifying characteristics of *Pseudomonas fluorescens* NRRL B-12596, said characteristics including resistance to greater than 1000 ppm of chromate in minimal salts medium and the capability for reducing Cr^{+6} to Cr^{+3} in an aqueous medium in the presence of an organic reductant both under aerobic conditions and under anaerobic conditions,

the Cr^{+3} being in the form of a precipitate substantially insoluble in water at neutral pH.

4,468,462

VECTORS FOR CLONING IN STREPTOMYCES

Nancy E. Malin, Cupertino, Calif.; Jeffrey T. Fayerman, Indianapolis, Ind.; Michael D. Jones, Nashville, Ind.; James A. Mabe, Indianapolis, Ind., and Walter M. Nakatsukasa, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 22, 1982, Ser. No. 452,168

Int. Cl.³ C12N *1/20, 1/00;* C12R *1/485, 1/54*

U.S. Cl. 435—253 **57 Claims**

1. A recombinant DNA cloning vector comprising:

(a) a functional origin of replication-containing restriction fragment of plasmid pNM100 and

(b) one or more DNA segments that confer resistance to at least one antibiotic when transformed into a sensitive host cell, said host cell being susceptible to transformation, cell division, and culture.

35. A transformed restrictionless *Streptomyces* host cell comprising a recombinant DNA cloning vector of claim 1.

4,468,463

PLANT FOR TREATING MANURES

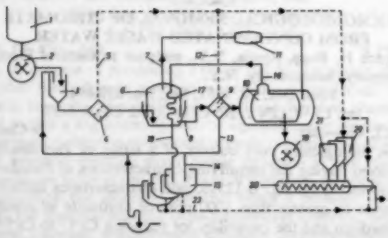
Hans M. Arsovic, Baden-Baden, Fed. Rep. of Germany, assignor to Societe Agricole et Fonciere S.A.F.S.A., Luxembourg-Ville, Luxembourg

Division of Ser. No. 201,399, filed as PCT EP 80/00016, Mar. 7, 1980, published as WO 80/01922, Sep. 18, 1980, § 102(e) date Oct. 17, 1980, Pat. No. 4,369,194. This application Aug. 18, 1982, Ser. No. 409,074

Claims priority, application Switzerland, Mar. 14, 1979, 2405/79

Int. Cl.³ C12M *1/02;* C05F *3/06*

U.S. Cl. 435—316 **5 Claims**



1. A plant for treating manures by diluting the manure, reacting the resulting liquid mixture to yield biogas, separating solid manure particles from the liquid and drying the separated manure particles, said plant comprising a universal grinder for finely shredding the manure, a mixing tank receiving shredded manure from said grinder, means for feeding liquid to said mixing tank for mixing with said shredded manure to yield a liquid mixture, first separator means for separating from said liquid mixture light weight solids comprising vegetable filaments and fibers including those derived from straw, a bioreactor receiving the remaining liquid mixture and reacting said liquid mixture to produce biogas, second separator means receiving the residual liquid mixture from said bioreactor and removing remaining solid substances therefrom, a drier receiving solid substances from said second separator means and fueled by biogas from said bioreactor, a heat exchanger in said bioreactor, means for conducting water vapor produced in said drier to said heat exchanger in which it is condensed to heat said bioreactor, a nitrification/denitrification sub-plant, conduit means connecting said second separator with said mixing tank and with said nitrification/denitrification sub-plant for supplying liquid from said second separator in part to said mixing tank and in part to said nitrification/denitrification, said nitrification/denitrification subplant comprising at least two units in series, each of said units comprising an oxidation tank and a settling tank interconnected in closed-circuit relationship, each of said oxidation tanks comprising air supply means, a first of said units treating the organic products and a second of said units treating ammonia, and means connecting said heat exchanger with said nitrification/denitrification sub-plant to conduct condensate from said heat exchanger to said nitrification/denitrification sub-plant.

4,468,464

BIOLOGICALLY FUNCTIONAL MOLECULAR CHIMERAS

Stanley N. Cohen, Menlo Park, and Herbert W. Boyer, Mill Valley, both of Calif., assignors to The Board of Trustees of The Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 687,430, May 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 520,691, Nov. 4, 1974, abandoned. This application Nov. 9, 1978, Ser. No. 959,288

The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.³ C12N *1/00, 15/00, 1/20;* C12P *21/00*

U.S. Cl. 435—317 **11 Claims**

1. As a composition of matter, a biologically functional recombinant plasmid capable of selection and replication in a prokaryotic cell comprising:

a first DNA segment containing an intact replicon recognized by said cell derived by cleaving a virus or plasmid compatible with said cell at other than the replicon site, which segment is covalently joined in vitro at its ends to the complementary ends of a second DNA segment foreign to said cell and having at least one intact gene, said second DNA segment derived from a source which does not exchange genetic information with said cell.

4,468,465

DIAGNOSING CANCER BY OBSERVING MARKER GLYCOSAMINOGLYCANS EXTRACTED FROM PATIENT

Clifford S. Sato, 11018 Bellbrook Dr., Houston, Tex. 77096

Filed Sep. 7, 1982, Ser. No. 415,774

Int. Cl.³ G01N *33/50, 27/26*

U.S. Cl. 436—64 **5 Claims**

2. A method of diagnosing cancer and hyperplasia of the human prostate by observing hybrid and copolymer glycosaminoglycans (GAGs) extracted from the patient.

4,468,466

SILVER STAINS FOR PROTEIN IN GELS—A MODIFIED PROCEDURE

James H. Morrissey, Oxford, England, assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 16, 1982, Ser. No. 349,313
Int. Cl.³ G01N *33/68*
U.S. Cl. 436—86 8 Claims

1. In a silver stain method for protein in gels utilizing treatment with a reducing agent followed by treatment with a silver salt and actuating irradiation, the improvement comprising

the use of a reducing agent consisting essentially of dithiothreitol in an amount effective to stain the protein but keep background staining to a minimum.

4,468,467

DIAZONIUM SALT FOR BILIRUBIN ASSAY

Bruce E. Babb, Rochester, and Glen M. Dappen, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

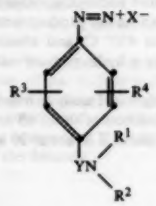
Filed Feb. 1, 1982, Ser. No. 344,433
Int. Cl.³ C07C *113/00*; G01N *33/72*
U.S. Cl. 436—97 17 Claims

11. In a method for the quantitation of bilirubin in a sample said method comprising the steps of

(1) contacting said sample with a reagent composition comprising an acid and a diazonium salt and

(2) measuring the amount of azobilirubin formed

the improvement wherein said diazonium salt has the formula:



wherein X^- is a stabilizing anion, Y is CO— or SO_2—; and R^1 and R^2 are independently selected from hydrogen, alkyl, aryl, carboxyalkyl and hydroxyalkyl providing R^1 and R^2 are not both hydrogen; R^3 and R^4 are independently selected from groups such that the sum of the Hammett sigma values for R^3 and R^4 does not exceed +0.4 or R^3 and R^4 represent the carbon atoms necessary to complete a fused carbocyclic ring structure.

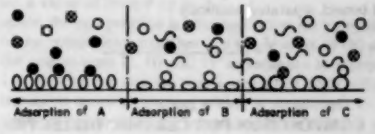
4,468,468

PROCESS FOR THE SELECTIVE ANALYSIS OF INDIVIDUAL TRACE-LIKE COMPONENTS IN GASES AND LIQUID

Alfred Benninghoven, Muenster-Roxel; Günther Kämpf, Krefeld, and Reimer Holm, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,298
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125335
Int. Cl.³ G01N *24/08*; H01J *49/26*
U.S. Cl. 436—173 10 Claims

1. In a process for analytically determining a given component present in a fluid, wherein the given component is deposited on a target and subsequently identified in a mass spectrometer, the improvement comprising: enriching the given component on the target relative to other components in the fluid within the range of monolayer by providing the target with a substantially flat, non porous solid target surface and treating the target surface either (a) before deposition of the given component to selectively absorb directly or indirectly in the form of a secondary product the given component or a group of components containing the given component or secondary



product, or (b) after deposition of the given component to extract other components which have been absorbed at the target surface together with the given component and transferring the enriched given component into the mass spectrometer.

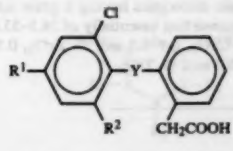
4,468,469

SUBSTITUTED PHENYLACETIC ACIDS AND SALTS AS TBP BLOCKING AGENTS IN IODOTHYRONINE IMMUNOASSAYS

David C. Atkinson; Robert J. Carrico, and David L. Morris, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 318,027, Nov. 4, 1981, abandoned. This application Sep. 3, 1982, Ser. No. 414,934
Int. Cl.³ G01N *33/52*, *33/54*
U.S. Cl. 436—500 44 Claims

1. In a homogeneous competitive binding immunoassay method for determining an iodothyronine in a sample of unextracted serum or plasma, wherein a reaction mixture is formed by combining said sample with reagents comprising an antibody to said iodothyronine, a labeled iodothyronine conjugate, and a TBP blocking agent, and wherein a spectrophotometric response is generated in said reaction mixture at a wavelength greater than about 300 nm which is related to the concentration of said iodothyronine in said sample, the improvement which comprises employing a compound of the formula:



wherein Y is O or NH and one of R^1 and R^2 is chloro and the other is hydrogen, or a salt thereof, as said TBP blocking agent, which compound has substantially no absorption at wavelengths greater than 300 nm.

4,468,470

METHOD AND A KIT FOR THE ASSAY OF ANTIBODIES TO SOLUBLE ANTIGENS

Robertus C. Aalberse, Duivendrecht, Netherlands, assignor to Stichting Centraal Laboratorium van de Bloedtransfusiedienst van het Nederlandse Rode Kruis, Amsterdam, Netherlands

Filed Apr. 30, 1982, Ser. No. 373,644
Claims priority, application Netherlands, May 2, 1981, 8102178
Int. Cl.³ G01N *33/54*
U.S. Cl. 436—539 10 Claims

1. In a method for the assay of antibodies to soluble antigens in an aqueous sample, by contacting said sample with antigens in vitro, wherein antibodies, if present, are bound by said antigens, the improvement which comprises utilizing an antigen that is modified with a recognizable group, said modified antigen being soluble in the test sample so that an interaction

between antigen and antibody occurs in a homogeneous solution, and reacting the modified antigen with the antibody bound to it, if present, with a precipitating or an insoluble reagent that interacts with the recognizable group, wherein said bound antibody is separated from the sample solution while unbound antibody remains in solution, and analyzing said bound separated antibody.

4,468,471

COMPOSITION FOR CERAMIC DIELECTRICS

Masao Kashima, and Yasuo Miyashita, both of Saitama, Japan, assignors to Mitsubishi Mining & Cement Company, Ltd., Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,804
Claims priority, application Japan, Mar. 15, 1982, 57-40396
Int. Cl.³ C04B *35/49*
U.S. Cl. 501—135 **1 Claim**

1. In a composition for temperature-compensating ceramic dielectrics useful in a layer-built capacitor, comprising La_2O_3-TiO_2-CaO-MgO based composite consisting of 3.0–25.0 mol % La_2O_3, 51.0–62.0 mol % TiO_2, 0.5–45.0 mol % CaO and 1.0–45.0 mol % MgO as a main component, the improvement wherein grain size is not more than five microns, and ZrO_2 is present as an additive, the amount of said ZrO_2 being 0.1 –8.0 weight % of said main component.

4,468,472

COMPOSITION FOR CERAMIC DIELECTRICS

Masao Kashima, and Yasuo Miyashita, both of Saitama, Japan, assignors to Mitsubishi Mining & Cement Company, Ltd., Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,384
Claims priority, application Japan, Dec. 17, 1981, 56-204211
Int. Cl.³ C04B *35/49*
U.S. Cl. 501—137 **2 Claims**

1. $MgTiO_3$-free ceramic dielectrics having a grain size not more than five microns consisting essentially of 24.5–53.4 mol % BaO, 1.0–3.5 mol % CeO_2, 0.1–2.0 mol % ZrO_2, 0.5–10.0 mol % CaO and 45.0–60.0 mol % TiO_2.

4,468,473

PROTOENSTATITE CERAMIC UNITS AND PROCESS FOR THEIR PREPARATION

Jean P. Drolet, and Jean P. Chevalier, both of Sherbrooke, Canada, assignors to Societe Nationale de Liamiante, Quebec, Canada

Filed Aug. 27, 1982, Ser. No. 412,208
Int. Cl.³ C04B *35/00*
U.S. Cl. 501—155 **8 Claims**

1. A process for the preparation of protoenstatite ceramic units which comprises:

(a) mixing 55 to 80 parts by weight of uncalcined demagnetized asbestos tailings with 22 to 44.0 parts by weight of a source of silica selected from the group consisting of (a) natural aluminum silicate and (b) a substantially pure silica and mixtures of (a) and (b), and from 0 to 17 parts of fluxing agents;

(b) compressing or extruding the said mixture into units;

(c) firing said units at a temperature of from 1250 ° to 1500° C., and,

(d) recovering protoenstatite ceramic units having as main constituents a MgO content of from 25 to 32% by weight and a SiO_2 content of from 55 to 65% by weight.

4,468,474

IRON/SILICON-BASED CATALYST EXHIBITING HIGH SELECTIVITY TO C_2–C_6 ALKENES IN CO/H_2 FISCHER-TROPSCH REACTIONS

Arunava Gupta, Madison, and James T. Yardley, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 16, 1983, Ser. No. 494,754
Int. Cl.³ B01J *37/34, 21/22;* **C01B** *31/36;* **C07C** *1/04*
U.S. Cl. 502—5 **8 Claims**

1. A finely divided hydrogen-activated catalyst composition comprising iron, silicon, and carbon and having improved selectivity to C_2–C_6 alkene products in CO/H_2 reactions prepared by a process which comprises contacting, in the gaseous phase, effective amounts of a silicon compound, a hydrocarbon and an organo-iron compound in a first reaction zone in the presence of a laser under conditions of laser power absorption, flow rate and pressure sufficient to produce finely divided powder and thereafter contacting said finely divided powder with H_2 gas at 450°–550° C. in a second reactor zone, for a time sufficient to produce a hydrogen-activated catalyst composition wherein by bulk chemical elemental analysis iron is about 5 to about 15 atom percent, silicon is about 65 to about 88 atom percent, carbon is about 2 to about 30 atom percent.

2. The catalyst composition of claim 1 wherein the catalyst composition comprises polycrystalline $FeSi_2$.

7. A finely divided, hydrogen-activated catalyst comprising iron, silicon and carbon and having a high selectivity to C_2–C_6 alkenes in CO/H_2 reactions, said catalyst being prepared by a process which comprises contacting effective amounts, in the gaseous phase, of a silicon compound, a hydrocarbon and an organo-iron compound under conditions to produce a product and thereafter contacting the product with H_2 gas at a temperature between about 450° C. and about 550° C. for a time sufficient to produce a hydrogen activated catalyst composition,

wherein by bulk chemical analysis iron is about 5 to about 15 atoms percent, silicon is about 65 to about 88 atom percent, carbon is about 2 to about 30 atom percent.

4,468,475

HYDROTHERMAL ACTIVATION OF ACID ZEOLITES WITH ALUMINA

Guenter H. Kuehl, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,511
Int. Cl.³ B01J *29/28, 37/26*
U.S. Cl. 502—71 **15 Claims**

10. A composite zeolite catalyst prepared by incorporating in a matrix a zeolite having a silica:alumina molar ratio of at least 70 and a constraint index from 1 to 12 and said catalyst having been hydrothermally treated with alumina-containing solid activating agent at an elevated temperature in the presence of an aqueous liquid medium to substantially increase the acid catalytic activity of the catalyst.

11. The composite catalyst of claim 10 wherein the zeolite consists essentially of HZSM-5 having a silica:alumina molar ratio of at least 2000:1, the activating agent consists essentially of hydrated alumina and the mixture is hydrothermally treated at about 100° to 370° C.

12. The composite catalyst of claim 11 wherein the calcined composite consists essentially of about 25% to 50% by weight alumina.

4,468,476

COLOR PRECURSOR REMOVAL FROM DETERGENT ALKYL BENZENES

Kang Yang, and James D. Reedy, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 392,431, Jun. 25, 1982, Pat. No. 4,433,196. This application Jan. 3, 1984, Ser. No. 556,678

Int. Cl.³ B01J *20/08*

U.S. Cl. 502—83 3 Claims

1. An adsorbent for removing from alkyl benzene, the precursors which cause color in sulfonated alkyl benzene comprising:

bauxite clay containing from about 0.1 to about 20 percent by weight of at last one material selected from a group consisting of iron oxides, titanium dioxide, and zirconium oxide; sulfuric acid added to the bauxite clay in an amount of from about 0.7 to about 20 percent by weight of sulfuric acid based on the total weight of the adsorbent; wherein the clay and sulfuric acid mixture is calcined at a temperature for a time sufficient to activate the adsorbent prior to use.

4,468,477

PRODUCTION OF CATALYST COMPONENT, CATALYST AND USE THEREOF

Anthony D. Caunt, Welwyn Garden City; Paul D. Gavens, Lower Stondon, and John McMeeking, Hertford, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 1, 1980, Ser. No. 164,930

Claims priority, application United Kingdom, Jan. 10, 1980, 8000882; Jun. 6, 1980, 8018582

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—104 12 Claims

1. A process for the production of a composition suitable for use as a component of an olefine polymerisation catalyst, which process comprises reacting together a component I which is at least one substantially inert solid metal oxide having reactive sites, with a component II which is an organic magnesium compound of the formula

$$R_c^2MgZ_{(2-c)}$$

or a complex or mixture of an organic magnesium compound and an aluminium compound of the formula

$$R_c^2MgZ_{(2-c)}dR_e^2AlZ_{(3-e)}$$

or of the formula

$$R_c^2MgZ_{(2-c)}+dR_e^2AlZ_{(3-e)}$$

a component III which is at least one halogen-containing component selected from hydrogen halides, hydrocarbylhalides, boron halides, halogens, inter-halogen compounds and halides of elements of Groups IVB, VB and VIB of the Periodic Table, and a component IV which is a transition metal compound of the formula

$$MO_aR_bX_{a'}$$

wherein:

M is transistion metal of Group IVA, VA or VIA of the Periodic Table;

X is a halogen atom other than fluorine;

R is a hydrocarbon radical, or a group OR^1;

R^1 is a hydrocarbon radical;

each R^2, which may be the same or different, is a hydrocarbon radical;

each Z, which may be the same or different, is a group OR^1 or a halogen atom other than fluorine;

n is 0 or a number up to the valency of M with the exception that when M is titanium n does not have a value of 4;

a is 0 or 1;

b is 0 or a number up to the valency of M;

$2a+b+n$ equals the valency of M,

c has a value of greater than 0 up to 2;

d has a value of greater than 0 up to 2; and

e has a value of from 0 up to 3

wherein the composition is obtained either (a) by mixing all of the components together in a single stage or (b) adding the components II, III and IV in sequence to component I subject to the proviso that a treatment with either the transition metal compound which is component IV, or a treatment with titanium tetrachloride, is effected as the last stage.

4,468,478

POLYURETHANES PREPARED FROM POLYOXYALKYLENES CONTAINING ALKALINE CATALYST RESIDUES CHELATED WITH BENZOIC ACID DERIVATIVES

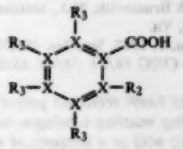
Edward M. Dexheimer, Grosse Ile; Michael J. Anchor, Canton Township; Basil Thir, Grosse Ile, and Stephen E. Eisenstein, Oak Park, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 311,668, Oct. 15, 1981, Pat. No. 4,426,301. This application Oct. 14, 1983, Ser. No. 541,884

Int. Cl.³ C08G *18/14, 18/28*

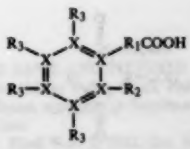
U.S. Cl. 521—125 8 Claims

1. A polyurethane comprising the reaction product of at least one organic polyisocyanate with an organic compound containing at least two active hydrogen atoms as determined by the Zerewitinoff Method wherein said organic compound comprises at least one polyoxyalkylene containing an effective oxidation inhibiting amount of an alkali or alkaline earth metal salt of at least one acid having the formulas:



(I)

or



(II)

wherein R_1 is selected from the group consisting of alkyl and alkenyl of up to 6 carbon atoms; R_2 is selected from the group consisting of hydroxyl, an alkyl ether residue having up to 4 carbon atoms, an hydroxyalkyl ether residue having up to 4 carbon atoms, and an alkenoxy or oxyalkanoic acid ester residue having up to 18 carbon atoms, and benzoyl; R_3 is individually selected from the group consisting of hydrogen, an alkyl ether residue having up to 4 carbon atoms, an hydroxyalkyl ether having up to 4 carbon atoms, an alkyl or alkenyl group having up to 6 carbon atoms, halogen, and carboxyl groups; and X is selected from the group consisting of (1) carbon and (2) carbon together with at least one of nitrogen, sulfur, or oxygen.

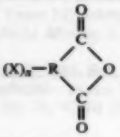
4,468,479

ESTER AND HALOGEN CONTAINING POLYOLS

Henry J. Barda, North Brunswick, N.J., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 7, 1982, Ser. No. 385,783
Int. Cl.³ C08G *18/14, 18/46, 63/68*
U.S. Cl. 521—171 **10 Claims**

1. A normally liquid flame retardant polyol ester prepared by a process consisting essentially of reacting a halogen containing anhydride of a dicarboxylic acid or a mixture of said anhydrides wherein said anhydride has the structure:



wherein R is a hydrocarbon group having the valence n+2 and is selected from the group consisting of benzene groups, naphthalene groups and alicyclic hydrocarbon groups containing 5 to 10 carbon atoms, X is selected from the group consisting of bromine and chlorine and n is an integer from 1 to 6, with 2 to about 10 moles of an aliphatic diol or mixture of diols per mole of said anhydride at a temperatue of about 100° C. to 250° C. to obtain a substantially fully esterified halogen containing product in which the acid number does not exceed 10 with the optional removal of unreacted diol during the course of the reacting or subsequent to the reacting.

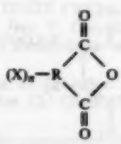
4,468,480

ESTER AND HALOGEN CONTAINING POLYOLS

Henry J. Barda, North Brunswick, N.J., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 7, 1982, Ser. No. 385,782
Int. Cl.³ C08G *18/14, 18/46, 63/68*
U.S. Cl. 521—171 **12 Claims**

1. A normally liquid flame retardant polyol ester prepared by a process comprising reacting a halogen containing anhydride of a dicarboxylic acid or a mixture, of said anhydrides wherein said anhydride has the structure:



wherein R is a hydrocarbon group having the valence n+2 and is selected from the group consisting of benzene groups, naphthalene groups and alicyclic hydrocarbon groups containing 5 to 10 carbon atoms, X is selected from the group consisting of bromine and chlorine and n is an integer from 1 to 6, with about 0.1 to about 1.5 moles of an aliphatic polyol having at least three hydroxy groups per mole of said anhydride and about 0.5 to about 20 moles of an aliphatic diol per mole of said anhydride, at a temperature of about 100° C. to 250° C., to obtain a substantially fully esterified halogen containing product in which the acid number does not exceed 10 with the optional removal of unreacted diol during the course of the reacting or subsequent to the reacting.

4,468,481

FLAME RETARDANT POLYURETHANE MODIFIED POLYISOCYANURATE

Henry J. Barda, North Brunswick; Burton J. Sutker, Edison, and William J. Eldridge, Berkeley Heights, all of N.J., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 16, 1982, Ser. No. 450,206
Int. Cl.³ C08G *18/28*
U.S. Cl. 521—171 **9 Claims**

1. A flame retardant polyurethane-modified polyisocyanurate foam composition prepared by a process comprising reacting an organic polyisocyanate, a trimerization catalyst, a blowing agent and a flame retardant amount of a normally liquid flame retardant polyol ester said polyol ester being prepared by a process comprising reacting a halogen containing anhydride of a dicarboxylic acid or a mixture of said anhydrides with 2 to 10 moles of an aliphatic diol or mixture of diols per mole of said anhydride to obtain a substantially fully esterified halogen containing product in which the acid number does not exceed 10 with the optional removal of unreacted diol during the course of the reacting or subsequent to the reacting.

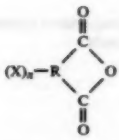
4,468,482

FLAME RETARDED POLYISOCYANURATE FOAM MADE FROM POLYOL DERIVED FROM HALOGEN CONTAINING DICARBOXYLIC ACID ANHYDRIDE

Henry J. Barda, North Brunswick; Burton J. Sutker, Edison, and William J. Eldridge, Berkeley Heights, all of N.J., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 12, 1983, Ser. No. 531,021
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—171 **9 Claims**

1. A flame retardant polyurethane-modified polyisocyanurate foam composition prepared by a process comprising reacting an organic polyisocyanate, a trimerization catalyst, a blowing agent and a flame retardant amount of a normally liquid flame retardant polyol ester said polyol ester being prepared by a process comprising reacting a halogen containing anhydride of a dicarboxylic acid or a mixture of said anhydrides wherein said anhydride has the following structure:



wherein R is a hydrocarbon group having the valence n+2 and is selected from the group consisting of benzene groups, naphthalene groups and alicyclic hydrocarbon groups containing 5 to 10 carbon atoms, X is selected from the group consisting of bromine and chlorine and n is an integer from 1 to 8, with an aliphatic polyol having at least three hydroxy groups and an aliphatic diol, to obtain a substantially fully esterified halogen containing product in which the acid number does not exceed 10 with the optional removal of unreacted diol during the course of the reacting or subsequent to the reacting.

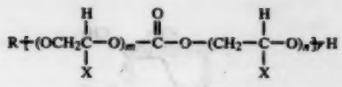
4,468,483

AROMATIC POLYESTER POLYCARBONATES FROM POLYOLS DERIVED FROM RECYCLED POLYETHYLENE TEREPHTHALATE

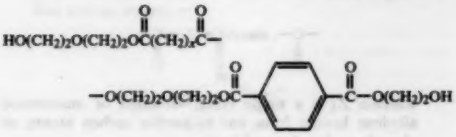
Ernest L. Yeakey, and Michael Cuscurida, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 5, 1983, Ser. No. 491,943
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—172 **8 Claims**

1. An aromatic polyester polycarbonate of the structure



where m and n independently are integers of from 1 to 5, r is an integer of from 1 to 5, X is hydrogen, methyl or ethyl and R is the residue of an aromatic polyester polyol of the structure



where x is an integer of from 2 to 4.

4,468,484

SETTABLE ALIGNATE COMPOSITIONS CONTAINING POLYACRYLAMIDE

Michael A. Pellico, Los Angeles, Calif., assignor to Laclede Professional Products, Inc., Gardena, Calif.

Continuation-in-part of Ser. No. 378,917, May 17, 1982, Pat. No. 4,381,947, which is a continuation-in-part of Ser. No. 220,303, Dec. 29, 1980, abandoned. This application May 2, 1983, Ser. No. 490,294

Int. Cl.³ A61K *6/08*

U.S. Cl. 523—109 **8 Claims**

1. In a two-component system interactable to form an oral, settable, dental composition comprising:

(i) Component A containing an alkali metal alginate selected from the group consisting of sodium alginate, potassium alginate and mixtures thereof in an aqueous paste; and

(ii) Component b containing a slightly water soluble, divalent metal salt and a reaction rate retarder in a fluid pasticizer paste that is substantially free of unbound water, said Component B being so formulated that a pre-selected quantity thereof contains from about 0.5 to about 1.2 parts by weight of divalent metal salt per 1.0 part by weight of alkali metal alginate in Component A, said reaction rate retarder being present in an amount from about 0.02 to about 0.13 part by weight per 1.0 part by weight of said divalent metal salt, and said fluid pasticizer being present in an amount from about 0.75 to about 2 parts by weight per 1.0 part by weight of said divalent metal salt, wherein:

said divalent metal salt is a member selected from the group consisting of calcium sulfate, ferrous sulfate, zinc sulfate, divalent metal salt of fatty acid and mixtures thereof,

said reaction rate retarder is a member selected from the group consisting of phosphate, pyrophosphate, citrate and silicate salts of sodium, potassium and mixtures thereof, and

said fluid pasticizer is a member selected from the group consisting of glycerol, propylene glycol, polyether glycol, oleyl alcohol, light silicone oil, light mineral oil, vegetable oil and mixtures thereof;

the improvement which comprises incorporating polyacrylamide into Component A in an amount from about 0.5 to about 6.0 wt. % based on the weight of Component A to thereby obtain a non-grainy, smoooth texture of the preset, blended components.

4,468,485

METHOD OF PREPARING POLYMER LATTICES OF HOMOGENEOUS INTERPENETRATED STRUCTURE

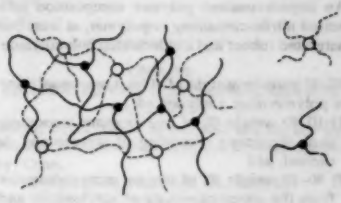
Albert Gourdenne, Ramonville St. Agne, and Pascal Heintz, Troyes, both of France, assignors to Electricite de France (Service National), Paris, France

Filed Jan. 11, 1983, Ser. No. 457,133

Claims priority, application France, Jun. 28, 1982, 82 11279

Int. Cl.³ C08J *3/24*; **C08L** *63/00, 63/06*

U.S. Cl. 523—137 **11 Claims**



1. In a method of preparing polymer lattices of interpenetrated structure starting from a mixture of at least two basic prepolymer constituents the improvement which resides in producing a homogeneous interpenetrated structure by applying microwave radiation to said mixture, the components of which are cross-linked by different polymerization mechanisms, the microwave radiation having a frequency spectrum chosen in order that it preferentially interacts with the first prepolymer and of a power intensity selected in order that it directly activates the exothermic cross-linking reaction of the first prepolymer, whilst only triggering the cross-linking of the second prepolymer under the combined action of the heat due to the interaction of the microwave energy with the second prepolymer and the heat introduced by the cross-linking reaction on the first prepolymer which makes possible the combined propagation of the two cross-linking reactions at similar speeds.

4,468,486

COATED SAND AND METHOD FOR PRODUCING

Noriaki Matsushima; Yukio Saeki, and Yukio Tokunaga, all of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Nov. 2, 1982, Ser. No. 438,556

Claims priority, application Japan, Nov. 2, 1981, 56-174512

Int. Cl.³ C08K *3/36*

U.S. Cl. 523—146 **40 Claims**

1. Resin coated sand for shell-molding operations comprising foundry aggregates coated with a phenolic resin and a carboxylic acid salt of an element selected from groups Ia, Ib, IIa, IIb, IIIa, IVa, Va, VIb, VIIb, or VIII of the Periodic Table of Elements, wherein the carboxylic acid salt is selected from formate, acetate, butyrate, benzoate, salicylate, fumarate, oxalate, acrylate, polyacrylate, methacrylate, polymethacrylate, adipate, lactate, citrate or succinate, and the ratio of carboxylic acid salt to phenolic resin is from about 0.5 to about 40 parts by weight to 100 parts phenolic resin.

4,468,487

POLYMER COMPOSITION COMPRISING NITRILE COPOLYMER, CPE AND RUBBER

Herman A. J. Schepers, Stein, and Wilhelmus A. M. Debets, Sittard, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 24, 1982, Ser. No. 423,313

Claims priority, application Netherlands, Sep. 25, 1981, 8104413

Int. Cl.³ C08L *23/28, 25/12, 19/00*

U.S. Cl. 524—87 **7 Claims**

1. An impact-resistant polymer composition including an unsaturated nitrile-containing copolymer, at least one substantially saturated rubber and a chlorinated polyethylene comprising:

A. 40–95 parts by weight of at least one copolymer obtained by polymerizing a mixture of:

(1) 10–90 weight % of one or more monomers selected from the group consisting of styrene and derivatives thereof, and

(2) 90–10 weight % of one or more monomers selected from the group consisting of acrylonitrile and methacrylonitrile; and

B. 5–60 parts by weight of a mixture comprising:

(1) a substantially saturated rubber, and

(2) chlorinated polyethylene having a chlorine content of from 32 to 45 weight %, a DSC crystallinity of 0–7% and an intrinsic viscosity of at least 1.0, and wherein the weight ratio between rubber and chlorinated polyethylene is from 2:1 to 1:10.

4,468,488

POLY(PIPERIDYLAMINE) ALKANES AND SYNTHETIC RESIN COMPOSITIONS STABILIZED THEREBY

Motonobu Minagawa, Koshigaya; Yutaka Nakahara, Iwatsuki; Toshihiro Shibata, Omiya, and Ryozo Arata, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Feb. 28, 1983, Ser. No. 470,103

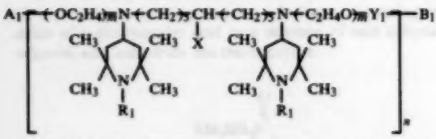
Claims priority, application Japan, May 7, 1982, 57-76430

Int. Cl.³ C08K *5/34;* **C08L** *25/06;* **C07D** *401/14, 401/12*

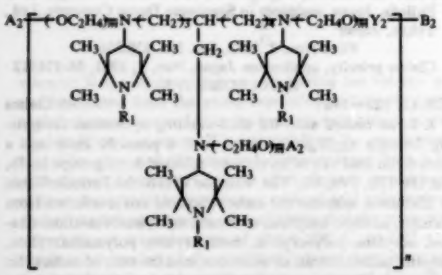
U.S. Cl. 524—99 **30 Claims**

1. Poly-(2,2,6,6-tetramethylpiperidylamino)alkanes having the formula (I) or (II):

(I)

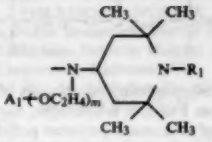


(II)

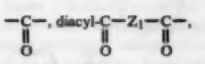


wherein:

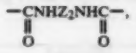
X is hydrogen or



Y_1 is carbonyl



wherein Z_1 is a single bond; saturated or unsaturated alkylene having from one to twelve carbon atoms; or phenylene; dicarbamoyl

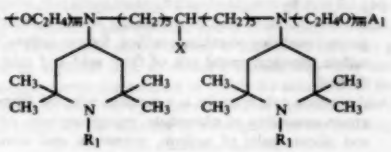


where Z_2 is alkylene having from two to twelve carbon atoms; cyclohexylene and alkylcyclohexylene having five to ten carbon atoms; or phenylene and alkyl phenylene having six to twelve carbon atoms; diphenylene; diphenylene ether; diphenylene alkane, the alkane having one to four carbon atoms; or

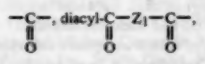
A_1 is hydrogen, alkyl, hydroxyalkyl or epoxy alkyl having one to eighteeen carbon atoms; phenalkyl having from six to ten carbon atoms; alkanoyl having from two to eighteen carbon atoms; acryloyl; phenoyl, alkylphenoyl, hydroxyphenoyl and alkylhydroxyphenoyl having from six to ten carbon atoms or $B_1—Y_1—$;

B_1 is $—OR_2$,

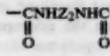
or



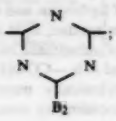
Y_2 is carbonyl



where Z_1 is a single bond; saturated or unsaturated alkylene having from one to twelve carbon atoms; or phenylene; dicarbamoyl



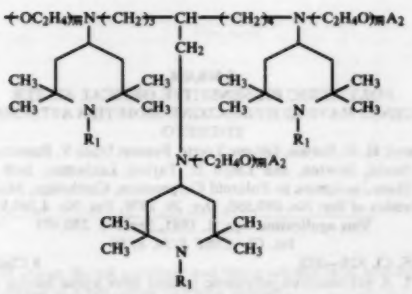
where Z_2 is alkylene having from two to twelve carbon atoms; cyclohexylene and alkylcyclohexylene having five to ten carbon atoms; or phenylene and alkyl phenylene having six to twelve carbon atoms; diphenylene, diphenylene ether; diphenylene alkane, the alkane having one to four carbon atoms; or



A_2 is hydrogen, alkyl, hydroxyalkyl or epoxy alkyl having one to eighteen carbon atoms; phenalkyl having from six to ten carbon atoms; alkanoyl having from two to eighteen carbon atoms; acryloyl; phenoyl, alkylphenoyl, hydroxyphenoyl and alkylhydroxyphenoyl having from six to ten carbon atoms or $B_2—Y_2—$;

B_2 is $—OR_2—$,

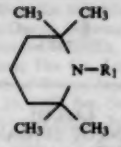
or



R_1 is hydrogen, alkyl, hydroxyalkyl or epoxy alkyl having one to eighteen carbon atoms; phenalkyl having from six to ten carbon atoms; alkanoyl having from two to eighteen carbon atoms; acryloyl; phenoyl, alkylphenoyl, hydroxyphenoyl and alkyhydroxyphenoyl having from six to ten carbon atoms or oxy;

R_2 is alkyl, hydroxyalkyl or epoxy alkyl having one to eighteen carbon atoms; phenalkyl having from six to ten carbon atoms; alkanoyl having from two to eighteen carbon atoms; acryloyl; phenoyl, alkylphenoyl, hydroxyphenoyl and alkylhydroxyphenoyl having from six to ten carbon atoms or aryl;

R_3 and R_4 each is hydrogen, alkyl, hydroxyalkyl or epoxy alkyl having one to eighteen carbon atoms; phenalkyl having from six to ten carbon atoms; alkanoyl having from two to eighteen carbon atoms; acryloyl; phenoyl, alkylphenoyl, hydroxyphenoyl and alkylhydroxyphenoyl having from six to ten carbon atoms or



m is 0 to 10;
n is 1 to 20.

4,468,489

STABILIZATION OF POLYCONDENSATION CATALYSTS

Kurt Weinberg, Upper Saddle River, N.J., and Gordon C. Johnson, Armonk, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 3, 1982, Ser. No. 384,500
Int. Cl.³ C08G 63/14, 63/34
U.S. Cl. 524—136 **18 Claims**

1. The process for the preparation of a high molecular weight light colored, polyethylene terephthalate comprising carrying out the polycondensation step of the reaction at a temperature between about 200° C. and 300° C. under reduced pressure in the presence of a metal-containing polycondensation catalyst wherein the metal is selected from the group consisting of titanium, zirconium, germanium, tin and mixtures thereof and a stabilization composition which is the reaction product of phosphoric acid, meta-phosphoric acid, superphosphoric acid, polyphosphoric acid or mixtures thereof and an aliphatic epoxide having between 2 and about 20 carbon atom.

4,468,490

ADHESIVE COMPOSITIONS

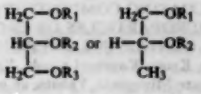
Max F. Meyer, Jr., and Richard L. McConnell, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1984, Ser. No. 591,707
Int. Cl.³ C08K 5/10; C08L 67/06
U.S. Cl. 524—311 **8 Claims**

1. Adhesive composition comprising

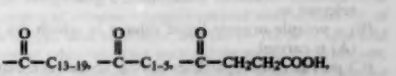
(a) a polyester derived from 50 to 100 mole % of an acid component comprising terephthalic acid, isophthalic acid, or a mixture of terephthalic and isophthalic acid, and a glycol component comprising at least one glycol having from 2 to 12 carbon atoms, said polyester having a melting point of about 80°–180° C. and a heat of fusion of less than 10 calories per gram, and

(b) from about 0.2% to about 25% based on the weight of said polyester of an ester selected from

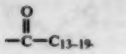


wherein R_1 is

or H and R_2 and R_3 are each



or H, and at least one of R_1, R_2 and R_3 is



4,468,491

FORMULATIONS OF DEFOAMING AGENTS CONTAINING POLYSILOXANES AND POLYETHERS

Helmut Steinberger, Leverkusen, and Heinrich Alberts, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,589

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1981, 3151957

Int. Cl.[3] **C08F** *283/06, 283/12;* **B01D** *17/00*

U.S. Cl. 524—493 **3 Claims**

1. A defoaming composition comprising by weight approximately

5–75% of water

0.5–15% of an emulsifying and/or dispersing auxiliary and,

94.5 to 10% of a polymer produced by polymerizing in the presence of a free-radical-forming catalyst a composition comprising by weight approximately

10–90% of a polydiorganosiloxane,

5–85% of a polyalkylene oxide or polyalkylene oxide derivative, and

5–85% of a vinyl monomer, thereby to form vinyl polymer bridges linking the polydiorganosiloxane and polyalkylene oxide or derivative thereof.

4,468,492

POLYMERIC ORGANO FUNCTIONAL SILANES AS REACTIVE MODIFYING MATERIALS

Robert Piccirilli, and Wen-Hsuan Chang, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 15, 1983, Ser. No. 514,139

Int. Cl.[3] **C08L** *83/00*

U.S. Cl. 525—102 **22 Claims**

1. An improved low temperature curing composition, comprising an essentially silicon-free polymer and a silicon group-containing material, characterized in that the silicon group-containing material is a hydrolyzable, non-gelled organosilicon group-containing polymer formed from reacting:

(a) an essentially silicon-free polymer having functional groups which are selected from isocyanate and active hydrogen; and

(b) an organosilicon group-containing material having functional groups reactive with the isocyanate and active hydrogen.

4,468,493

HIGH SOLID COATING COMPOSITION CONTAINING NOVEL MICROPARTICLES OF CROSSLINKED COPOLYMER CONTAINING AMPHOIONIC GROUPS

Shinichi Ishikura, Kyoto; Kazunori Kanda, Yao; Katsuaki Kida, Osaka, and Ryuzo Mizuguchi, Yahata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jan. 25, 1983, Ser. No. 460,877

Claims priority, application Japan, Jan. 27, 1982, 57-13052

Int. Cl.[3] **C08L** *75/06, 61/28*

U.S. Cl. 525—123 **1 Claim**

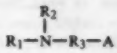
1. In a high solid coating composition comprising

(A) a film-forming polymer having functional group(s) capable of reacting with the crosslinking agent (D) hereinafter referred to,

(B) a volatile organic liquid diluent in which the polymer (A) is carried,

(C) polymer microparticles having an average diameter of from 0.02 to 40 microns, which are insoluble in the combination of the film-forming polymer (A) and the diluent (B) and are maintained in a stabilized state of dispersion therein, and

(D) a crosslinking agent dissolved in the diluent (B), the improvement wherein the microparticles (C) are composed of crosslinked copolymer obtained by copolymerizing at least one of the polymerizable amino acid compounds of the formula:



in which R_1 is a substituent having a polymerizable α,β-ethylenic unsaturated bond, R_2 represents a member selected from the group consisting of hydrogen and substituted or unsubstituted $C_1 \sim C_{30}$ hydrogen residue, R_3 is a member selected from the group consisting of substituted or unsubstituted $C_1 \sim C_2$ hydrocarbon residue and A is —COOH or —SO_3H, with other polymerizable α,β-ethylenically unsaturated monomers, at least part of which is crosslinking monomer.

4,468,494

POLYMERIC PH-SENSITIVE OPTICAL FILTER AGENTS HAVING HYDRAZONE MOIETIES ATTACHED THERETO

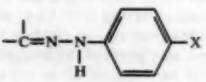
Derek H. R. Barton, Gif-sur Yvette, France; Irena Y. Bronstein-Bonte, Newton, and Lloyd D. Taylor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 089,558, Oct. 29, 1979, Pat. No. 4,269,925. This application Apr. 2, 1981, Ser. No. 250,401

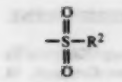
Int. Cl.[3] **C08F** *8/34, 8/30*

U.S. Cl. 525—353 **9 Claims**

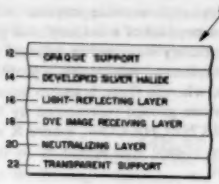
1. A pH-sensitive polymeric optical filter agent having attached directly or indirectly to the backbone thereof the following hydrazone moiety:

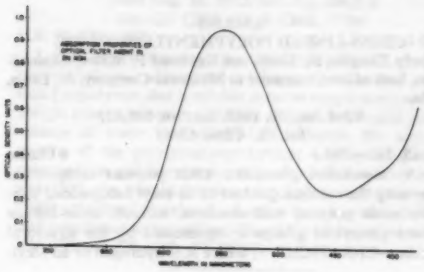


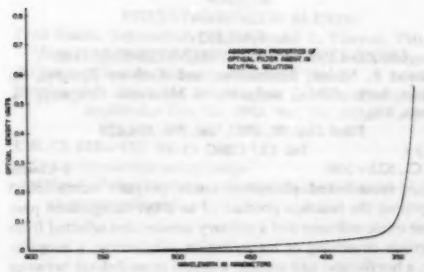
wherein X is an electron-withdrawing group selected from the group consisting of halogen, halogen-substituted alkyl or



where R^2 is alkyl, aryl, substituted-alkyl or substituted aryl, said optical filter agent exhibiting light-absorbing capability at







a pH above the pKa thereof and being substantially non-light absorbing at a pH below the pKa thereof.

4,468,495

FIRE RETARDANT POWDERS

Glenn A. Pearson, P.O. Box 6051, Alexandria, Va. 22305

Filed Jan. 28, 1983, Ser. No. 462,078

Int. Cl.³ C08L *85/02, 61/24;* C08G *79/04*

U.S. Cl. 525—158 **10 Claims**

1. A fire retardant composition comprising a powder resin which is the reaction product of the following components: (a) about 70–110 parts by weight of an aldehyde, (b) about 120–180 parts by weight of an ammonium phosphate, (c) about 120–180 parts by weight of ammonium sulfate, (d) about 120–180 parts by weight of urea, (e) about 35–50 parts by weight of alkanolamine, and (f) about 100–150 parts by weight of phosphoric acid, components (a), (b), (c), (d) and (e) having been mixed together and heated at temperatures of about 160°–200° F., the phosphoric acid then being added to a mixture of all the other components.

4,468,496

POLYBUTADIENE RUBBER COMPOSITIONS

Yasumasa Takeuchi; Mitsuhiko Sakakibara; Nobuo Tagata, all of Yokkaichi; Masaki Ogawa, Sayama; Yasushi Hirata, Higashimurayama, and Shigeru Tomihira, Kodaira, all of Japan, assignors to Bridgestone Tire Co., Ltd. and Japan Synthetic Rubber Co., Ltd., both of Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,509

Claims priority, application Japan, Jul. 31, 1981, 56-119303

Int. Cl.³ C08L *9/00, 9/02, 47/00*

U.S. Cl. 525—233 **8 Claims**

1. A rubber composition having excellent fracture properties and cut growth resistance, consisting of 10 to 95 parts by weight of polybutadiene having a content of cis-1,4 bond of at least 70% and an average chain length of 1,4-sequence of 110–450 and 90 to 5 parts by weight of at least one diene rubber.

4,468,497

ELASTOMER MODIFIED BIS-MALEIMIDE RESIN

Sidney W. Street, Hacienda Heights, and Don A. Beckley, Newport Beach, both of Calif., assignors to Hitco, Irvine, Calif.

Continuation of Ser. No. 248,978, Mar. 30, 1981, Pat. No. 4,377,657, which is a division of Ser. No. 134,666, Mar. 27, 1980, Pat. No. 4,351,932. This application Jan. 24, 1983, Ser. No. 460,250

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.³ C08L *39/04*

U.S. Cl. 525—422 **13 Claims**

1. A resin system comprising in combination:

a major proportion of at least one ethylenically unsaturated, N,N'-bis-imide;

a minor amount of a divinyl aryl ethylenically diunsaturated cross-linking agent capable of addition polymerization cross-linking with the bis-imide at temperature from above 100 degrees F. to 250 degrees F.; and

1 to 15 percent by weight of compatible elastomers that are compatible with the bis-imide and cross-linking agent.

4,468,498

SEQUENTIAL HETEROPOLYMER DISPERSION AND A PARTICULATE MATERAL OBTAINABLE THEREFROM, USEFUL IN COATING COMPOSITIONS AS A THICKENING AND/OR OPACIFYING AGENT

Alexander Kowalski, Glenside; Martin Vogel, Jenkintown, and Robert M. Blankenship, Lansdale, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 158,759, Jun. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 52,280, Jun., 1979, abandoned. This application Feb. 25, 1982, Ser. No. 352,397

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.³ C08F *265/02*

U.S. Cl. 525—301 **15 Claims**

1. A process of making an aqueous dispersion of water insoluble core/sheath polymer particles in which the core contains sufficient acid groups to render the core swellable by neutralization with a volatile base to at least twice its volume and the sheath is permeable to said base, comprising

(a) sequentially emulsion polymerizing at a temperature of from about 10° to about 100° C. in an aqueous medium containing a free radical initiator: one or more monoethylenically unsaturated core monomers having a group of the formula —HC=C<, at least one of which has a carboxylic acid group, emulsified in the medium, the core monomer(s) comprising a hydrophilic monomer selected from (i) a non-acid monomer copolymerized with at least 5% of a carboxylic acid monomer, and (ii) 15–100% of said acid monomer when no other hydrophilic monomer is present, based on the weight of the monomers utilized to prepare the core polymer particles to thereby form dispersed core

polymer particles, said core particles having an average diameter of from about 0.05 to 1 micron, the core monomers having no more than 40% of butyl acrylate or no more than an amount of an equivalent monomer which would give a comparable T_i when using the same comonomer combination, and

(b) then adding to the polymer dispersion resulting from (a) at least one monoethylenically unsaturated sheath monomer having no ionizable group to form a sheath polymer on the core particles, any monoethylenically unsaturated carboxylic acid in the sheath monomer mixture being present in an amount of no more than 10% by weight of the sheath monomers, the proportion of carboxylic acid in the sheath monomer mixture being less than ½ the proportion thereof in the core monomer mixture, the core/sheath particles having an average diameter before neutralization and swelling of from about 0.07 to 4.5 microns, relative amount of core-forming monomer(s) and sheath-forming monomer(s) being such that the ratio of the weight of the core to the weight of the total polymer in the resulting dispersed particles is from about 1:4 to 1:100, said sheath being permeable at 20° C. to an aqueous volatile base selected from ammonia and amines, and essentially impermeable at 20° C. to fixed or permanent bases including sodium, potassium, calcium or magnesium hydroxide, the exterior sheath having a Ti of below about 25° C. or below or about the ambient temperature of application, said sheath being film forming, the core polymer being relatively hard or crosslinked, the particles being film forming;

(c) neutralizing with ammonia or amine so as to swell said core.

4,468,499

THERMOPLASTIC INTERPENETRATING POLYMER NETWORK COMPOSITION AND PROCESS

David L. Siegfried, Wescoesville; David A. Thomas, and Leslie H. Sperling, both of Bethlehem, all of Pa., assignors to Lehigh University, Bethlehem, Pa.

Continuation of Ser. No. 200,272, Oct. 24, 1980, abandoned. This application May 26, 1982, Ser. No. 382,301

Int. Cl.³ C08L *53/02, 33/02*

U.S. Cl. 525—301 **17 Claims**

1. A composition comprised of at least two polymers, the second of which is polymerized in the presence of the first of said polymers in a mutual solution of said first polymer and a prepolymer or monomer of said second polymer, at least one of said polymers comprising a continuous phase within said composition, said polymers being crosslinked by a non-covalent bonding mechanism selected from the group consisting of

(a) ionomeric attraction; and

(b) block copolymers, each having at least three blocks, at least one of said blocks comprising an elastomeric block and at least two of said blocks comprising physically crosslinked glassy blocks, crystalline blocks, or hydrogen bonded blocks, wherein one of said polymers is a triblock copolymer containing monoalkenyl arene polymer end blocks and the other of said polymers is a monoalkenyl arene monomer copolymerized with an acid forming mer, further wherein from 10 to 100% of said mer is first neutralized by one of an alkali or alkaline earth hydroxide or amine,

said polymers forming interpenetrating polymer networks, said composition being thermoplastic and having phase domain regions with maximum cross sections below 500 Nanometers.

4,468,500

AMINO KETONE CROSS-LINKED POLYPHENYLENE OXIDE

Raymond F. Malon, Edmundson, and Anthony Zampini, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,611

Int. Cl.³ C08G *65/48*

U.S. Cl. 525—390 **6 Claims**

1. A cross-linked polyphenylene oxide polymer composition comprising the reaction product of a haloacylated phenylene oxide polymer and a primary monoamine selected from the group consisting of methylamine, ethylamine, a propylamine, a butylamine and aniline, wherein there is amino ketone cross-linkage between phenylene groups represented by the structural formula —COCHR'NRCHR'CO—, where R is methyl, ethyl, propyl, butyl or phenyl and where R' is hydrogen, methyl, ethyl or propyl.

4,468,501

CROSS-LINKED POLYPHENYLENE OXIDE

Anthony Zampini, St. Louis, and Raymond F. Malon, Edmundson, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,627

Int. Cl.³ C08G *65/48*

U.S. Cl. 525—390 **6 Claims**

1. A cross-linked phenylene oxide polymer composition comprising the reaction product of an alkyl halogenated phenylene oxide polymer and ammonia, wherein cross-linkage between phenylene groups is represented by the structural formula —CHRNHCHR—, where R is hydrogen or an alkyl.

4,468,502

CROSS-LINKED POLYPHENYLENE OXIDE

Raymond F. Malon, Edmundson, and Anthony Zampini, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,629

Int. Cl.³ C08G *65/48*

U.S. Cl. 525—390 **6 Claims**

1. A cross-linked phenylene oxide polymer composition comprising the reaction product of an alkyl halogenated phenylene oxide polymer and a primary monoamine selected from the group consisting of methylamine, ethylamine, a propylamine, a butylamine and aniline, wherein cross-linkage between phenylene groups is represented by the structural formula $-CH_2NRCH_2-$, where R is methyl, ethyl, a propyl, a butyl or phenyl.

4,468,503

AMINO KETONE CROSS-LINKED POLYPHENYLENE OXIDE

Anthony Zampini, St. Louis, and Raymond F. Malon, Edmundson, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,632

Int. Cl.³ C08G *65/48*

U.S. Cl. 525—390 **6 Claims**

1. A cross-linked phenylene oxide polymer composition comprising the reaction product of a haloacylated phenylene oxide polymer and ammonia, wherein there is amino ketone cross-linkage between phenylene groups represented by the structural formula —COCHRNHCHRCO—, where R is hydrogen, methyl, ethyl or propyl.

4,468,504

THERMOSETTING RESIN MASSES BASED UPON AMINOPLAST

Robert Kuemmel, Vaihingen, Fed. Rep. of Germany, assignor to August Krempel Soehne GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,470
Int. Cl.³ C08G 65/32, 12/32
U.S. Cl. 525—406 6 Claims

1. Thermosetting, hardenable, flame-inhibiting and self-extinguishing resin mass based upon a conventional aminoplast or reaction resin and optionally containing a conventional cold or warm hardening system, wherein it contains melamine borate.

4,468,505

COATING COMPOSITION

Michael W. Bowen, Midlothian, Va., and Robert G. Parrish, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 18, 1982, Ser. No. 409,324
Int. Cl.³ C08G 69/48; C08L 77/00
U.S. Cl. 525—432 3 Claims

1. A polymeric composition consisting essentially of a poly[-hexamethylene adipamide]-poly[poly-(oxyethylene) adipamide] copolymer that is soluble at room temperature at 1% by weight concentration in a solvent composed of equal parts by volume of water and ethanol and wherein the molecular weight of the poly[poly(oxyethylene) adipamide] grouping calculated as poly(oxyethylene)diamine is between about 300 and 1200, the weight fraction of poly(hexamethylene adipamide) calculated as nylon 6—6 salt is between 18 and 37, and said copolymer composition falls within the area bounded by XY, YZ and ZX of the FIGURE.

4,468,506

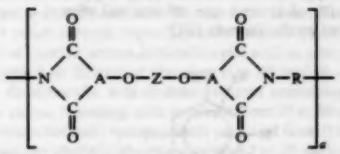
POLYETHERIMIDE BLENDS

Fred Holub, Schenectady, N.Y.; Daniel E. Floryan, Pittsfield, Mass., and Dwain M. White, Schenectady, N.Y., assignors to General Electric Company, Pittsfield, Mass.

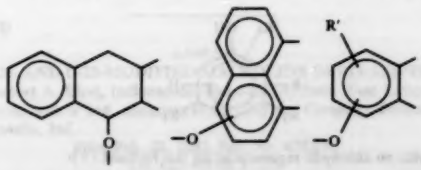
Continuation of Ser. No. 364,904, Apr. 2, 1982, abandoned. This application Dec. 21, 1983, Ser. No. 563,549
Int. Cl.³ C08L 79/08
U.S. Cl. 525—432 9 Claims

1. A composition comprising:

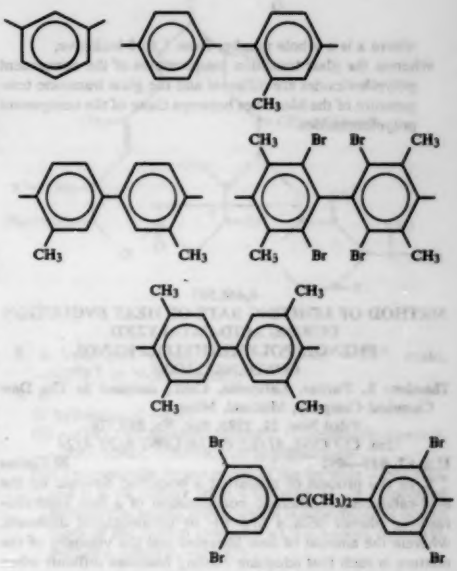
a blend of two or more polyetherimides selected from the class consisting of



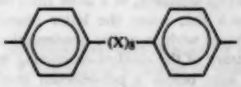
where a represents a whole number in excess of 1, the group —O—A is selected from:



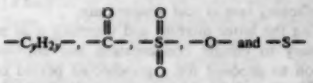
R' being hydrogen, lower alkyl or lower alkoxy, Z is a member of the class consisting of (1)



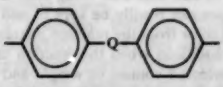
and (2) divalent organic radicals of the general formula:



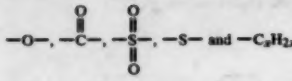
where X is a member selected from the class consisting of divalent radicals of the formulas,



where q is 0 or 1, y is a whole number from 1 to 5, and R is a divalent organic radical selected from the class consisting of (1) aromatic hydrocarbon radicals having from 6–10 carbon atoms and halogenated derivatives thereof, (2) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, and C (2–8) alkylene terminated polydiorganisiloxane, and (3) divalent radicals included by the formula:



where Q is a member selected from the class consisting of



where x is a whole number from 1 to 5 inclusive;

wherein the glass transition temperatures of the component polyetherimides are different and the glass transition temperature of the blend lies between those of the component polyetherimides.

4,468,507

METHOD OF LIMITING RATE OF HEAT EVOLUTION DURING ACID-CATALYZED PHENOL/POLYMETHYLOLPHENOL CONDENSATIONS

Theodore L. Parker, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 21, 1983, Ser. No. 553,718
Int. Cl.³ C08L 61/12, 61/14; C08G 8/20, 8/24
U.S. Cl. 525—491 **20 Claims**

1. In the process of preparing a branched novolac by the acid-catalyzed, exothermic condensation of a first methylol-reactive phenol with a first tri- or tetramethylol diphenol, wherein the amount of heat liberated and the viscosity of the mixture is such that adequate cooling becomes difficult when the condensation is carried out on a large scale, the improvement comprising:

(1) providing a condensation mixture formed by

(a) mixing a second methylol-reactive phenol and a second tri- or tetramethylol diphenol, in a mole ratio and in a total amount such that when the latter phenols are reacted in admixture with an acidic condensation catalyst the temperature of the catalyst-containing mixture can readily be kept below a pre-selected level, said second phenol being the same as or different from said first phenol and said second diphenol being the same as or different from said first diphenol;

(b) mixing the resultant mixture of said second phenols with enough of an acid catalyst so that they will react at a satisfactory rate at said temperature,

(c) stirring the latter mixture and warming it as may be necessary to initiate condensation and allowing the reaction to proceed for a preselected period of time while cooling or heating as necessary to keep the temperature of the reaction mixture within a preselected range below said level;

(2) bringing said condensation mixture to a temperature in said preselected range, stirring it and

(d) incrementally or continuously adding to the stirring mixture a preformed mixture of said first phenols and, separately, an acidic catalyst for the condensation thereof, and cooling or heating as necessary to maintain the reaction temperature within said range,

the composition of said preformed mixture, the stirring rate and the rates of said additions being such that the reaction temperature can readily be kept in said range by transfer of heat to or from the reaction mixture; and

(e) terminating said additions when the reaction mixture has attained a preselected volume or weight and thereafter maintaining the temperature of the mixture within a preselected range for an end period of preselected duration.

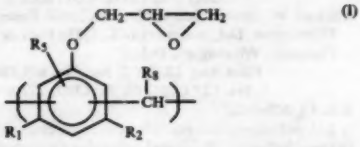
4,468,508

GLYCIDYL ETHER OF NOVOLAK TYPE SUBSTITUTED PHENOLIC RESIN, PROCESS FOR PRODUCING THE SAME, AND ENCAPSULATING COMPOUND COMPOSED MAINLY OF THE SAME

Iko Ito; Yoshiki Toyoshima; Tsutomu Takahashi, and Noriaki Saito, all of Ehime, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

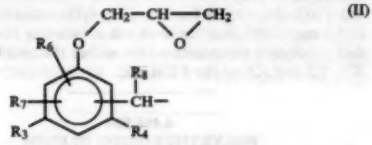
Filed Aug. 19, 1983, Ser. No. 524,630
Claims priority, application Japan, Aug. 20, 1982, 57-145316
Int. Cl.³ C08G 59/08
U.S. Cl. 525—507 **15 Claims**

1. A glycidyl ether of novolak type substituted phenolic resin having 1 to 40 repeating units on the number-average which comprises a substantially linear polymer composed of the repeating units represented by the formula (I):



(I)

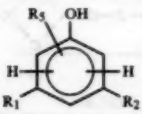
substantially all the terminals of the moleculer chains of said polymer being modified with a group represented by the formula (II):



(II)

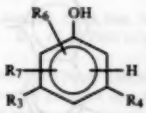
wherein R_1, R_2, R_3 and R_4, which may be the same or different, are members selected from the group consisting of hydrogen atom, alkyl groups having 1 to 8 carbon atoms, aromatic group, and halogen atom; R_5, R_6 and R_7, which may be the same or different, are members selected from the group consisting of alkyl groups having 1 to 10 carbon atoms, aromatic group, aryl group, and halogen atom; and R_8 is a member selected from the group consisting of hydrogen atom and alkyl groups having 1 to 4 carbon atoms.

8. A process for producing a glycidyl ether of novalak type substituted phenolic resin which comprises polycondensing 30 to 95 mol% of at least one difunctional phenol component represented by the formula (III):



(III)

and 5 to 70 mol% of at least one monofunctional phenol represented by the formula (IV):



(IV)

with an aldehyde represented by the formula (V):

R_8CHO (V)

wherein R_1, R_2, R_3 and R_4, which may be the same or different, as members selected from the group consisting of hydrogen atom, alkyl groups having 1 to 8 carbon atoms, aromatic group, and halogen atom; R_5, R_6 and R_7, which may be the same or different, are members selected from the group consisting of alkyl groups having 1 to 10 carbon atoms, aromatic group, aryl group, and halogen atom; and R_8 is a member selected from the group consisting of hydrogen atom and alkyl groups having 1 to 4 carbon atoms to form a novolak type substituted phenolic resin and subsequently glycidyl etherifying the resin with an epihalohydrin.

4,468,509

REVERSIBLY OXIDIZABLE OR REDUCIBLE POLYMERS CONTAINING POLYENE UNITS, THEIR PREPARATION AND THEIR USE

Herbert Naarmann, Wattenheim; Volker Muench, Ludwigshafen, and Klaus-Dieter Franz, Kelkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,665

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232483

Int. Cl.³ C08F 12/32

U.S. Cl. 526—284 **4 Claims**

1. A polymer which comprises polyene units possessing 5 or more conjugated aliphatic C—C double bonds in the polymer main chain, which contains, as chemically bonded side groups, 1,9-disubstituted phenalenes, wherein the polymer main chain is linked to the 9-position of the phenalene side groups.

4,468,510

POLYESTERS OF TRANS-4,4'-STILBENEDICARBOXYLIC ACID, TEREPHTHALIC ACID OR 2,6-NAPHTHALENEDICARBOXYLIC ACID, 1,2-PROPANEDIOL AND 1,3-PROPANEDIOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 475,567, Mar. 15, 1983, Pat. No. 4,420,607. This application Nov. 14, 1983, Ser. No. 551,395

Int. Cl.³ C08B 63/18, 63/54

U.S. Cl. 528—298 **6 Claims**

1. A film forming copolyester comprising repeating units prepared from 100 to 50 mol % trans-4,4'-stilbenedicarboxylic acid or esters thereof, repeating units prepared from 0 to 50 mol % of another aromatic dicarboxylic acid or esters thereof containing 8 to 20 carbon atoms or 0 to 40 mol % of an aliphatic dircarboxylic acid or esters thereof containing 3 to 10 carbon atoms, repeating units prepared from 10 to 60 mol % of 1.3-propanediol and repeating units prepared from 0 to 40 mol % of another aliphatic glycol containing 2 to 10 carbon atoms, provided that said copolyester contains at least 10 mol % of repeating units from said aromatic dicarboxylic acid or esters thereof, said aliphatic dicarboxylic acid or esters thereof, or said aliphatic glycol.

4,468,511

C-20- AND C-23-MODIFIED MACROLIDE DERIVATIVES

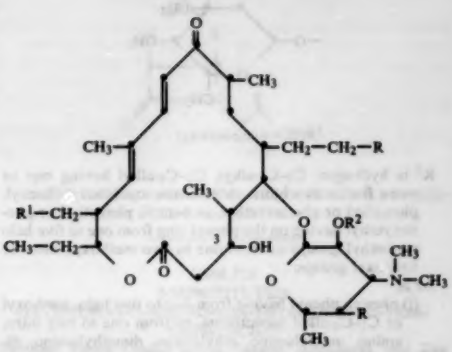
Herbert A. Kirst, Indianapolis, and John E. Toth, West Lafayette, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 28, 1983, Ser. No. 470,890

Int. Cl.³ C07H 17/08

U.S. Cl. 536—7.1 **31 Claims**

1. A compound of the formula



R is hydrogen, cyano, —OR^4, —OAr, —SR^5, azido, —NR^6R^7, or N-phthalimido;

R^1 is

(i) hydrogen or —OH;

(ii) —OAr, -O-tetrahydrofuranyl, -O-tetrahydropyranyl, —SR^5, azido, —NR^6R^7, or N-phthalimido;

(iii) a monocyclic amino group of the formula —$N(CH_2)_n$ and n is an integer from 4 through 15; or a specified monocyclic amino group which is substituted at one or more of the carbon atoms by a C_1–C_3-alkyl, hydroxyl, methoxy, ethoxyl, —$N(R^8)_2$,

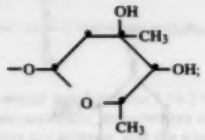
carbomethoxy, carboethoxy, or phenyl group;

(iv) a monocyclic saturated or unsaturated nitrogen-containing heterocyclic ring bonded through the nitrogen atom, said ring having (1) from 5 to 7 ring atoms which include up to 3 additional heteroatoms selected from nitrogen, oxygen and sulfur, and (2) up to 3 substituent groups selected from methyl, ethyl and phenyl; or

(v) a bicyclic or tricyclic secondary amino group selected from 1,2,3,4-tetrahydroquinolin-1-yl; decahydroquinolin-1-yl; 1,2,3,4-tetrahydroisoquinolin-2-yl; decahydroisoquinolin-2-yl; indolin-1-yl; isoindolin-2-yl; decahydrocyclohepta[b]pyrrol-1-yl; decahydrocyclohepta[c]pyrrol-2-yl; decahydrocyclopent[c]azepin-2-yl; decahydrocyclopent[d]azepin-3-yl; 2,3,4,5-tetrahydro-1H-2-benzazepin-2-yl; 2,3,4,5-tetrahydro-1H-3-benzazepin-3-yl; azabicycloheptanyl; azabicyclooctanyl; azabicyclononanyl; azabicyclodecanyl or azatricyclodecanyl;

R^2 is hydrogen; C_1–C_5-alkanoyl; C_1–C_5-alkanoyl having from one to three halo substituents; benzoyl, phenylacetyl or phenylpropionyl; or benzoyl, phenylacetyl or phenylpropionyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups;

R^3 is hydrogen; hydroxyl; C_1–C_5-alkanoyloxy; C_1–C_5-alkanoyloxy having from one to three halo substituents; benzoyloxy, phenylacetoxy or phenylpropionyloxy; or benzoyloxy, phenylacetoxy or phenylpropionyloxy having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups; or



(mycarosyloxy)

R^4 is hydrogen; C_1–C_4-alkyl; C_1–C_4-alkyl having one or more fluoro or chloro substituents; cyclohexyl; benzyl, phenethyl or phenoxyethyl; or benzyl, phenethyl or phenoxyethyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups;

Ar is

(i) phenyl; phenyl having from one to five halo, methoxyl or C_1–C_4-alkyl substituents, or from one to two nitro, amino, methylamino, ethylamino, dimethylamino, diethylamino, C_4–C_{10}-methyleneamino, azido, hydroxy, hydroxymethyl, aminomethyl, (methylamino)methyl, (ethylamino)methyl, (dimethylamino)methyl, (diethylamino)methyl, (C_4–C_{10}-methyleneamino)methyl, formyl, acetyl, benzoyl, methoxycarbonyl, ethoxycarbonyl, carboxamido, N-methylcarboxamido, N,N-dimethylcarboxamido, cyano, phenyl, phenoxy or benzyl substitutents; or naphthyl;

(ii) a heteroaryl group selected from pyridinyl, pyrimidinyl, pyridazinyl, pyrazinyl, triazinyl, indolyl, isoquinolinyl, quinolinyl, quinazolinyl, cinnolinyl, quinoxalinyl, phthalazinyl, benzotriazolyl, benzoxazolyl, benzimidazolyl, carbazolyl, or acridinyl; or a specified heteroaryl group having a C_1–C_4-alkyl, halo, methoxy, ethoxy, hydroxy or keto or phenyl substituent;

(iii) C_1–C_5-alkanoyl; C_1–C_5-alkanoyl having from one to three halo substitutents; methanesulfonyl; trifluoromethanesulfonyl; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl, phenylsulfonyl or phenylthioacetyl; or benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl, phenylsulfonyl or phenylthioacetyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups;

R^5 is C_1–C_4-alkyl; C_1–C_4-alkyi having one or more fluoro or chloro substituents, cyclohexyl; phenyl, benzyl or phenethyl; phenyl, benzyl or phenethyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups; a heteroaryl group selected from imidazolyl, pyrazolyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, triazinyl, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, oxadiazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thienyl and furanyl; or a specified heteroaryl group having a C_1–C_4-alkyl, halo, methoxy, ethoxy, hydroxy or keto or phenyl substituent;

R^6 is hydrogen; C_1–C_6-alkyl; C_1–C_6-alkyl having one or more fluoro or chloro substituents; phenyl; benzyl; phenethyl or C_3–C_8-cycloalkyl;

R^7 is an R^6 group or C_1–C_5-alkanoyl; C_1–C_5-alkanoyl having from one to three halo substitutents; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl or phenylthioacetyl; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl or phenylthioacetyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups; or alkoxycarbonyl; and

R^8 is hydrogen, methyl, ethyl, n-propyl or isopropyl or the R^8 groups taken together form a polymethylene moiety such that $—N(R^8)_2$ constitutes a cyclic amino group selected from pyrrolidinyl, piperidinyl, hexahydroazepinyl or octahydroazocinyl; provided (1) that, when R or R^4 is hydrogen, R^1 cannot be hydrogen or —OH; (2) that, when R or R^1 is —NHR^6 or R^8 is hydrogen, R^2 must be hydrogen, R^3 must be hydrogen, hydroxyl, or mycarosyloxy and Ar cannot be a type (iii) substitutent; and (3) that, when R^2 is hydrogen, R^3 must be hydrogen, hydroxyl or mycarosyloxy; and to the acid addition salts of these compounds.

4,468,512

1-N-ACYLATED AND 1-N-ALKYLATED DERIVATIVES OF 4-O-SUBSTITUTED-2-DEOXYSTREPTAMINE AMINOGLYCOSIDES

Herbert A. Kirst, and Brenda A. Truedell, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 304,291, Sep. 9, 1981, Pat. No. 4,424,345, which is a continuation-in-part of Ser. No. 189,231, Sep. 22, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,122

Int. Cl.³ C07H *15/22*

U.S. Cl. 536—16.8 **33 Claims**

1. A 1-N-acylated or 1-N-alkylated derivative of a 4-O-substituted-2-deoxystreptamine aminoglycoside selected from the group consisting of:

apramycin, 3′-hydroxyapramycin,

α or β-(C_1 to C_6 alkyl)aprosaminide,

α or β-(C_2 to C_6 hydroxyalkyl)aprosaminide,

α or β-(C_2 to C_6 aminoalkyl)aprosaminide,

α or β-(C_2 to C_6 protected aminoalkyl)aprosaminide,

α or β-(C_3 to C_6 aminohydroxyalkyl)aprosaminide,

α or β-(C_3 to C_6 (protected amino)hydroxyalkyl)aprosaminide, and the pharmaceutically acceptable acid addition salts thereof;

wherein the acyl or alkyl substituent group is selected from the group consisting of

γ-amino-α-hydroxybutyryl, γ-protected amino-α-hydroxybutyryl, β-amino-α-hydroxypropionyl, β-protected amino-α-hydroxypropionyl, glycyl, N-protected glycyl, 3-hydroxypyrrolidine-3-carbonyl, N-protected 3-hydroxypyrrolidine-3-carbonyl, 3-hydroxyazetidine-3-carbonyl, N-protected 3-hydroxyazetidine-3-carbonyl, 2-hydroxy-2-(azetidin-3-yl)acetyl, N-protected 2-hydroxy-2-(azetidin-3-yl)acetyl, 4-amino-2-hydroxybutyl, 3-amino-2-hydroxypropyl, 2-aminoethyl, 3-hydroxypyrrolidine-3-methylene, 3-hydroxyazetidine-3-methylene, 2-hydroxy-2-(azetidin-3-yl)ethyl, Cto C_4 alkyl, C_3 to C_5 allyl, benzyl and substituted benzyl.

4,468,513

2′-N-ACYLATED AND 2′-N-ALKYLATED DERIVATIVES OF 4-O-SUBSTITUTED-2-DEOXYSTREPTAMINE AMINOGLYCOSIDES

Herbert A. Kirst, and Brenda A. Truedell, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 304,292, Sep. 21, 1981, Pat. No. 4,424,344, which is a continuation-in-part of Ser. No. 189,440, Sep. 22, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,207

Int. Cl.³ C07H *15/22*

U.S. Cl. 536—16.8 **32 Claims**

1. A 2′-N-acylated or 2′-N-alkylated derivative of a 4-0-substituted-2-deoxystreptamine aminoglycoside selected from the group consisting of: apramycin,

α or β-(C_1 to C_6 alkyl)aprosaminide,

α or β-(C_2 to C_6 hydroxyalkyl)aprosaminide,

α or β-(C_2 to C_6 aminoalkyl)aprosaminide,

α or β-(C_2 to C_6 protected aminoalkyl)aprosaminide, α or β-(C_3 to C_6 aminohydroxyalkyl)aprosaminide, α or β-(C_3 to C_6 (protected amino)hydroxyalkyl)aprosaminide, and the pharmaceutically acceptable acid addition salts thereof;

wherein the acyl or alkyl substituent group is selected from the group consisting of γ-amino-α-hydroxybutyryl, γ-protected amino-α-hydroxybutyryl, β-amino-α-hydroxypropionyl, β-protected amino-α-hydroxypropionyl, glycyl, N-protected glycyl, 3-hydroxypyrrolidine-3-carbonyl, N-protected 3-hydroxypyrrolidine-3-carbonyl, 3-hydroxyazetidine-3-carbonyl, N-protected 3-hydroxyazetidine-3-carbonyl, 2-hydroxy-2-

(azetidin-3-yl)acetyl, N-protected 2-hydroxy-2-(azetidin-3-yl)acetyl, 4-amino-2-hydroxybutyl, 3-amino-2-hydroxypropyl, 2-aminoethyl, 3-hydroxypyrrolidine-3-methylene, 3-hydroxyazetidine-3-methylene, 2-hydroxy-2-(azetidin-3-yl)ethyl, C_2 to C_4 alkyl, C_3 to C_5 allyl, benzyl and substituted benzyl.

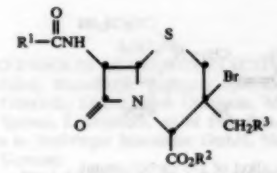
4,468,514

PREPARATION OF 3-BROMOCEPHALOSPORINS FROM THIAZOLINE AZETIDINONES

Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 17, 1982, Ser. No. 450,707
Int. Cl.³ C07D *501/04*
U.S. Cl. 544—27 **9 Claims**

1. A process for preparing a 3-bromo-3-methylcepham of the formula



wherein:

R^1 is an organic radical;

wherein R^1 is:

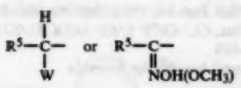
(a) C_1–C_7 alkyl, cyanomethyl, C_1–C_6 haloalkyl, 4-protected amino-4-protected carboxybutyl; or

(b) C_1–C_6 alkoxy, phenoxy, benzyloxy or 4-methoxybenzyloxy; or

(c) the group —R^4 wherein R^4 is phenyl or substituted phenyl wherein the substitutes are 1 or 2 halogens, protected hydroxy, cyano, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, protected carboxy, protected carboxymethyl, protected hydroxymethyl, protected aminomethyl, or a bicyclic aryl group selected from naphthyl, benzothienyl, substituted naphthyl or substituted benzothienyl; or

(d) an arylalkyl group of the formula R^4—$(O)_m$—CH_2— wherein R^4 is as defined above, and m is 0 or 1; or

(e) a substituted arylalkyl group of the formula



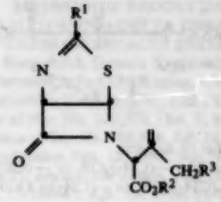
wherein R^5 is R^4 as defined above, 2-thienyl, 3-thienyl, 2-protected aminothiazol-4-yl, 2-furyl or 3-furyl; W is protected hydroxy, protected carboxy, protected amino, or

(f) a heteroarylmethyl group of the formula R^6—CH_2— wherein R^6 is 2-thienyl, 3-thienyl, 2-protected aminothiazol-4-yl, 2-furyl, 3-furyl, 2thiazolyl, 5-tetrazolyl, 1-tetrazolyl;

R^2 is a carboxy protecting group;

R^3 is hydrogen, bromo, chloro, acetoxy, alkylthio or arylthio;

comprising reacting a thiazoline azetidinone of the formula



with a bromine source and dimethyl sulfoxide at a temperature of about 0° C. to about 50° C.

4,468,515

2-SUBSTITUTED OXYIMINO-2-(5-AMINO-1,2,4-THIADIAZOL-3-YL)ACETIC ACIDS

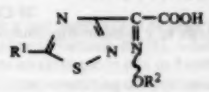
Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 116,984, Jan. 20, 1980, Pat. No. 4,332,798, which is a continuation-in-part of Ser. No. 108,161, Dec. 28, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 325,027

Claims priority, application United Kingdom, Dec. 29, 1978, 7850334; Oct. 12, 1979, 7935538; Denmark, Dec. 21, 1979, 5542/79

Int. Cl.³ C07D *285/08*
U.S. Cl. 548—128 **13 Claims**

1. A compound of the formula:



wherein R^1 is amino or a protected amino, and R^2 is carbamoyl; lower alkanoyl; lower alkoxycarbonyl; aroyl; ar(lower)alkanoyl; cyclo(lower)alkyl(lower)alkanoyl; ar(lower)alkoxycarbonyl; (lower)alkanesulfonyl; arenesulfonyl; aryl; alkaryl; aryl and alkaryl substituted in the aryl nucleus with 1 to 3 substituent(s) selected from the group consisting of halogen, lower alkoxy, nitro, halo(lower)alkyl, and protected carboxy; substituted lower alkyl selected from the group consisting of ar(lower)alkyl, lower alkylthio(lower)alkyl, halo(lower)alkyl, aryloxy(lower)alkyl, cyano(lower)alkyl, protected carboxy(lower)alkyl, di(lower)alkylcarbamoyl(lower)alkyl, lower alkoxy(lower)alkoxy(lower)alkyl, lower alkanesulfonyl(lower)alkyl, protected amino(lower)alkyl, amino(lower)alkyl, carboxy(lower)alkyl, ar(lower)alkyl substituted with protected carboxy, ar(lower)alkyl substituted with carboxy, ar(lower)alkyl substituted with protected amino(lower)alkyl, and ar(lower)alkyl substituted with amino(lower)alkyl; lower alkenyl, lower alkynyl; cycloalkyl; cycloalkyl substituted with carboxy or protected carboxy; cyclo(lower)alkenyl; or S or O containing 5-membered heterocyclic group substituted with oxo group(s); and salts thereof.

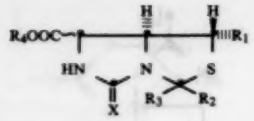
4,468,516

PROCESS FOR THE PREPARATION OF BIOTIN

Robert A. Volkmann, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 17, 1982, Ser. No. 379,247
Int. Cl.³ C07D *513/04*
U.S. Cl. 548—154 **8 Claims**

1. A compound of the formula



wherein X is sulfur or oxygen;

R_1 is $-(CH_2)_4CH_3$, $-(CH_2)_3OR$ or $-(CH_2)_5OR$ wherein R is alkyl, $-(CH_2)_4CN$, or $-(CH_2)_4COOR'$ wherein R' is alkyl or phenyl;

R_2 and R_3 when taken together, are cycloalkyl or $-CH_2-CH_2-Y-CH_2-CH_2$ wherein Y is sulfur, oxygen or NR'' wherein R'' is COOR''' wherein R''' is alkyl; or R_2 and R_3 when taken separately, are each alkyl, cycloalkyl or phenyl, provided that R_2 and R_3 are not both phenyl; and

R_4 is hydrogen, alkyl, alkoxyalkyl, cycloalkyl, monoalkyl-substituted-cycloalkyl, dialkyl-substituted cycloalkyl, benzyl, phenyl or mono-, di or trialkyl substituted phenyl; and, when R_4 is hydrogen, the addition salts thereof; said alkyl and alkoxy having from 1 to 4 carbon atoms and said cycloalkyl having from 5 to 7 carbon atoms.

4,468,517

SYNTHESIS OF THIAZOLES

Gifford P. Marzoni, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 12, 1983, Ser. No. 493,883
Int. Cl.³ C07D *277/14, 277/28*
U.S. Cl. 548—189 **20 Claims**

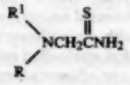
1. A process for the synthesis of a 4-halomethylthiazole of the formula

wherein

X is bromo, chloro or iodo;

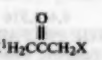
Y is a chlorine or bromine atom derived from the dehydrating agent; and

R and R^1 independently represent C_1–C_3 alkyl, or R and R^1 combine with the nitrogen atom to which they are attached to form pyrrolidino, piperidino or morpholino; which process comprises reacting a thioamide of the formula



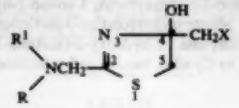
or a salt thereof,

with a dihalopropanone of the formula



wherein X^1 is bromo, chloro or iodo;

in the presence of a haloalkane solvent and an alkali metal bicarbonate; to prepare a hydroxythiazoline intermediate of the formula



and dehydrating that intermediate with a chloro or bromo dehydrating agent chosen from PCl_3, PBr_3, PCl_5, PBr_5, $POCl_3$, $POBr_3$, SO_2Cl_2, $SOCl_2$ and $SOBr_2$.

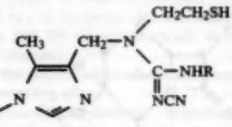
4,468,518

IMIDAZOLE GUANIDINE COMPOUNDS AND METHOD OF MAKING SAME

Michitaro Fujimoto, Tondabayashi; Giichi Funazo, Toyonaka; Hirokazu Seki, Nara; Shuhei Takamatsu, Sakai, and Takeshi Sakai, Nara, all of Japan, assignors to Fujimoto Pharmaceutical Corporation, Osaka, Japan

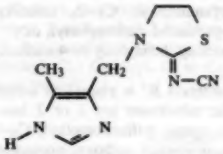
Filed Jun. 27, 1983, Ser. No. 508,181
Claims priority, application Japan, Aug. 19, 1982, 57-143567
Int. Cl.³ C07D *233/64*
U.S. Cl. 548—342 **4 Claims**

1. A guanidine derivative of the formula



wherein R is alkyl of 1–5 carbon atoms.

3. A method of producing the compound of claim 1 which comprises reacting an isothiourea derivative of the formula:



with an alkylamine of 1–5 carbon atoms in the alkyl moiety.

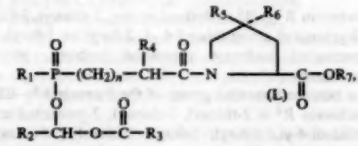
4,468,519

ESTERS OF PHOSPHINYLALKANOYL SUBSTITUTED PROLINES

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 14, 1982, Ser. No. 388,371
Int. Cl.³ C07F *9/65*; A61K *31/675*
U.S. Cl. 548—409 **9 Claims**

1. A compound having the formula



or a salt thereof, wherein

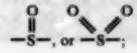
R_1 is alkyl, aryl, arylalkyl, cycloalkyl, or cycloalkylalkyl;

R_2 is cycloalkyl, 3-cyclohexenyl, or 2-alkyl-3-cyclohexenyl;

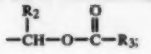
R_3 is alkyl, cycloalkyl, phenyl or alkoxy;

R_4 is hydrogen or alkyl;

one of R_5 and R_6 is hydrogen and the other is alkyl-X-, phenyl-X-, alkoxy, phenyloxy, phenyl, cycloalkyl, alkyl, or phenylalkyl; or together R_5 and R_6 are $-XCH_2CH_2X-$; and X is —S—,



R_7 is hydrogen or



and n is 0 or 1.

4,468,520

3-CYANO-INDOLES AS CARDIOSELECTIVE AGENTS

Helmut Michel, Mannheim; Wolfgang Kampe, Heddesheim; Roland Ofenloch, Lorsch; Karl Dietmann, Mannheim, and Gisbert Sponer, Laudenbach, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

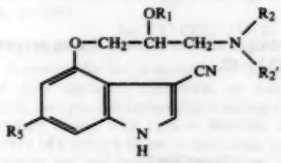
Filed Jul. 29, 1981, Ser. No. 288,075

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030047

Int. Cl.³ C07D *209/04;* A61K *31/40*

U.S. Cl. 424—274 8 Claims

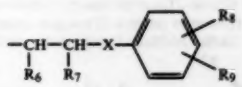
1. An aminopropanol of the formula



in which

R_1 is a hydrogen atom, a C_{1-6}-alkanoyl radical or a benzoyl radical optionally substituted by halogen, nitro, C_{1-4}-alkyl or C_{1-4}-alkoxy radical,

R_2 is a C_{1-6}-alkyl radical or a radical of the formula



X is a valency bond, a methylene group or an oxygen atom,

R_6 and R_7 each independently is a hydrogen atom or a C_{1-6}-alkyl radical,

R_8 and R_9 each independently is a hydrogen or halogen atom, or a hydroxyl, C_{1-6}-alkyl, C_{1-6}-alkoxy, or C_{2-6}-alkenyloxy radical or one of them is an aminocarbonyl radical,

R'_2 is a hydrogen atom or a benzyl radical,

R_5 is a hydrogen atom or a C_{1-6}-alkyl radical,

or a pharmacologically acceptable salt thereof.

4,468,521

METHOD OF PRODUCING GAMMA-HALOGENO-DELTA UNSATURATED CARBOXYLIC ACID ESTERS

Mori Fumio, Kurashiki; Omura Yoshiaki, Mitsu; Nishida Takashi, Kurashiki, and Itoi Kazuo, Kitakanbara, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

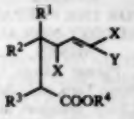
Continuation of Ser. No. 840,279, Oct. 7, 1977, abandoned, which is a division of Ser. No. 705,176, Jul. 14, 1976, abandoned. This application Feb. 22, 1982, Ser. No. 350,566

Claims priority, application Japan, Jul. 22, 1975, 50-89507; Dec. 29, 1975, 50-158047; Apr. 30, 1976, 51-50595

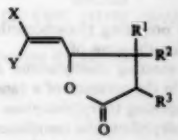
Int. Cl.³ C07C *69/743*

U.S. Cl. 560—124 19 Claims

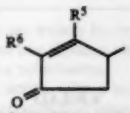
1. A method of producing a γ-halogeno-δ-unsaturated carboxylic acid ester of the general formula:



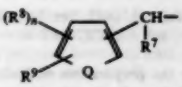
which comprises reacting a γ-lactone derivative of the general formula:



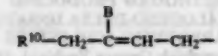
with a hydrogen halide of general formula HX and an alcohol of general formula R^4OH, wherein R^1 and R^2, respectively, mean an alkyl group of 1 to 5 carbon atoms; R^3 is selected from the group consisting of hydrogen, alkyl groups of 1 to 5 carbon atoms and cycloalkyl groups of 3 to 8 carbon atoms; R^4 is an alcohol residue selected from the group consisting of alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkynyl,



wherein R^5 is selected from the group consisting of hydrogen and methyl; R^6 is selected from the group consisting of alkenyl, alkadienyl, alkynyl and benzyl,



wherein R^7 is selected from the group consisting of hydrogen, ethynyl and cyano; R^8 is selected from the group consisting of hydrogen, halogen and alkyl; R^9 is selected from the group consisting of halogen, alkyl, alkenyl, alkynyl, benzyl, thenyl, furylmethyl, phenoxy and phenylthio; R^8 and R^9, taken together, may form a polymethylene chain which may be interrupted by a sulfur or oxygen atom; Q is a member selected from the group consisting of —O—, —NH—, —S— and —CH=CH—; n is 1 or 2, A—CH_2— wherein A is selected from the group consisting of phenoxyphenyl, phthalimide, thiophthalimids, di- or tetrahydrophthalimido and dialkylmaleimido and



wherein R^{10} is selected from the group consisting of phenyl, thienyl and furyl; B is a halogen atom; and X and Y are halogen atoms which may be the same or different.

4,468,522

PROCESS FOR THE PREPARATION OF (OMEGA-CARBOALKOXY-NOR.ALKYL)-DIALKYLAMINES

Gian Paolo Chiusoli, Parma; Mirco Costa, Reggio Emilia; Luciano Pallini, Fornovo Taro, and Giuliana Terenghi, Castelnovo di Sotto, all of Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Apr. 6, 1982, Ser. No. 366,095

Claims priority, application Italy, Apr. 10, 1981, 21030 A/81

Int. Cl.³ C07L *101/18*

U.S. Cl. 560—155 **8 Claims**

1. A process for preparing (5-carbomethoxy-n-pentyl)-diethylamine comprising the steps of:

(a) mixing and reacting diethylamine and gamma-vinyl-butyrolactone in the presence of a catalyst selected from the group comprising triarylphosphine complexes of palladium and trialkylphosphite complexes of nickel;

(b) treating the reaction product with methanol and hydrochloric acid to produce (5-carbomethoxy)-2-pentenyl-diethylamine; and

(c) hydrogenating (5-carbomethoxy)-2-pentenyldiethylamine in the presence of Ni-Raney as a catalyst to form (5-carbomethoxy-n-pentyl)-diethylamine.

4,468,523

SYNTHESIS OF DIALKYL OXALATES BY THE HETEROGENEOUSLY CATALYZED OXIDATIVE CARBONYLATION OF ALCOHOLS

John J. Leonard, Springfield, and John A. Sofranko, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 16, 1982, Ser. No. 388,855

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—204 **14 Claims**

1. A process for the preparation of dialkyl oxalates by the oxidative carbonylation of a liquid saturated monohydric aliphatic or alicyclic alcohol containing from 1 to 20 carbon atoms with a mixture of carbon monoxide and oxygen or an oxygen-containing gas at a temperature of from about 40° C. to 150° C. and a total pressure of between about 500 psig and 6000 psig in the presence of an essentially insoluble hetrogeneous tri-metallic-containing catalyst comprising a solid mixture of (1) palladium metal or a salt thereof, (2) vanadium in the form of its oxide, and (3) titanium metal or a non-hydrolyzable salt thereof, said catalyst containing as the metal on a weight percent basis palladium, vanadium and titamium in the range of from about .01:1:1 to about 0.2:1:1 respectively, and recovering the desired dialkyl oxalate.

4,468,524

ALKENYLPHENYL SUBSTITUTED ACRYLATES OR METHACRYLATES

Sheik A. Zahir, Oberwil, and Sameer H. Eldin, Birsfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

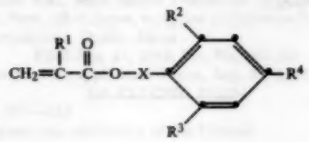
Division of Ser. No. 248,755, Mar. 30, 1981, Pat. No. 4,387,204. This application Sep. 16, 1982, Ser. No. 418,874

Claims priority, application Switzerland, Apr. 11, 1980, 2787/80

Int. Cl.³ C07C *69/54*

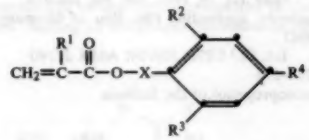
U.S. Cl. 560—221 **2 Claims**

1. An acrylate or methacrylate of the formula I

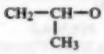


wherein R^1 is a hydrogen atom or methyl, X is $—CH_2CHOHCH_2O—$, R^2 is allyl, methallyl or 1-propenyl, R^3 is a hydrogen atom or methyl or has the meaning of R^2, and R^4 is a hydrogen atom, methyl, methallyl, allyl or 1-propenyl.

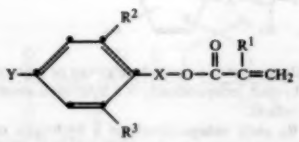
2. An acrylate or methacrylate of the formula I



wherein R^1 is a hydrogen atom or methyl, X is an oxygen-carbon bond, $CH_2—CH_2—O$,



or $CH_2—CHOH—CH_2—O$, and R^2 is allyl, methallyl or 1-propenyl, R^3 is a hydrogen atom or methyl or has the meaning of R^2, and R^4 is a radical of the formula



wherein X, R^1, R^2 and R^3 have the meanings assigned to them above, and Y is a carbon-carbon bond, alkylene of 1 to 6 carbon atoms, alkylidene of 2 to 6 carbon atoms, cycloalkylidene containing 5 or 6 ring carbon atoms, an oxygen atom, a sulfur atom or a group of the formula CO, SO or SO_2.

4,468,525
PREPARATION OF DIACYLOXYHEXADIENES FROM HEXATRIENES

Hans-Martin Weitz, Bad Durkheim, and Rolf Fischer, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

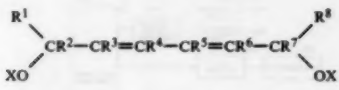
Division of Ser. No. 287,278, Jul. 27, 1983, abandoned. This application Apr. 29, 1983, Ser. No. 490,152

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3030997

Int. Cl.³ C07C *67/055*

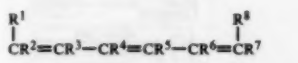
U.S. Cl. 560—244 **9 Claims**

1. A process for the preparation of a diacyloxyhexadiene of the formula



I

where X is R^9—CO— and R^1 to R^9 are hydrogen or alkyl of 1 to 3 carbon atoms, which comprises reacting a hexatriene of the formula



II

with oxygen and a carboxylic acid of the formula R^9COOH in the presence of a catalyst which contains palladium or platinum or a salt of these metals.

4,468,526
PROCESS FOR THE PREPARATION OF THIURAM DISULFIDES

Ludwig Eisenhuth, Elsenfeld; Hans G. Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Feb. 16, 1982, Ser. No. 349,353

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1981, 3105587

Int. Cl.³ C07C *155/10*

U.S. Cl. 564—76 **9 Claims**

1. A process for the preparation of thiuram disulfides substituted with aliphatic, araliphatic, or aromatic hydrocarbon radicals, said process comprising reacting a suitably substituted secondary amine with carbon disulfide in a solvent in the presence of a tertiary amine or ammonia, oxygen or an oxygen-containing gas, and metalliferous catalyst, wherein said carbon disulfide and said secondary amine are reacted in a molar ratio of 1.0 to 1.2:1, said reaction being maintained at a temperature between 0° and 200° C., said metalliferous catalyst being selected from the group consisting of elemental copper, copper(I) chloride, copper(I) bromide, copper(I) iodide, addition compounds of copper(I) halides with carbon monoxide, alkali chlorocuprates, complex ammoniacates of copper(I) cyanide, potassium tricyanocuprate(I), double salts with copper(I) thiocyanate, copper(I) acetate, copper(I) sulfide, complex double sulfides of copper(I) sulfide, alkali polysulfides, copper(II) chloride, copper(III) bromide, copper(II) sulfide, copper(II) nitrate, copper(II) thiocyanate, copper(II) cyanide, copper(II) acetate, copper dithiocarbamate, complex ammoniacates of copper(II) salts, copper(I) oxide, metallic cerium, cerium dioxide, cerium(III) chloride, cerium chloride, cerium chlorocomplex salts, cerium nitrate, cerium nitrato salts, cerium sulfate, cerium carbonate, cerium oxalate, cerium sulfides, vanadium oxide, vanadium chloride, vanadium sulfates, molybdenum oxides, molybdenum chloride, molybdenum sulfide, molybdenum fluoride, molybdates, molybdenum complex acido salts, powdered manganese, manganese dioxide, potassium permanganates, manganese dithiocarbamates, manganese acetate, the manganese derivatives corresponding to the above copper compounds, iron oxides, iron(II) and iron(III) salts, complex iron salts, cobalt oxides, cobalt(II) salts, cobalt complex salts, and double and complex vanadium salts.

4,468,527
FLUORINATED ALCOHOLS

Kalyanji U. Patel, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 214,324, Dec. 8, 1980, Pat. No. 4,340,749, which is a division of Ser. No. 101,515, Dec. 21, 1979, Pat. No. 4,264,484, which is a continuation-in-part of Ser. No. 6,252, Jan. 24, 1979, abandoned. This application Mar. 15, 1982, Ser. No. 358,335

Int. Cl.³ C07C *143/76, 43/12, 31/34*

U.S. Cl. 564—96 **3 Claims**

1. An alcohol having the formula

$$R_f\text{—}Q\text{—}A\text{—}OH$$

where

R_f is a fluoroaliphatic, saturated, monovalent radical having at least three fully fluorinated carbon atoms and not more than 20 carbon atoms, said alcohol having more than 25 weight % carbon-bonded fluorine in the form of said fluoroaliphatic radical,

Q is selected from the group consisting of —CO—, —CONR—, —SO_2NR—, —SO_2—, C_nH_{2n}—, —C_6H_4—, —C_6H_3Cl—, —OC_2H_4—, or combinations thereof, where R is H or lower alkyl containing 1 to 6 carbon atoms, and n is 1 to 20, and

A is a divalent organic moiety having 2 to 30 carbon atoms, containing at least one aliphatic chlorine atom, and free of hydroxyl-reactive substituents,

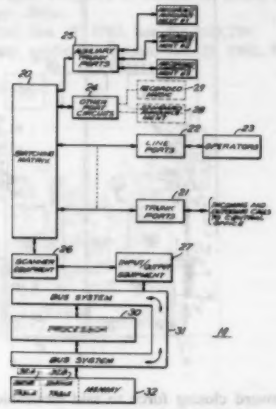
said alcohol upon reaction with a mono- or polycarboxylic acid forming the corresponding ester which in combination with water-insoluble addition polymer derived from polymerizable ethylenically unsaturated monomer free of nonvinylic fluorine forms a composition suitable for the treatment of carpet to render it durably soil resistant and stain repellant, said ester containing at least 25 percent by weight of carbon-bonded fluorine, in the form of said fluoroaliphatic radical, and having at least one major transition temperature higher than about 25° C., said polymer having at least one major transition temperature higher than about 25° C.

4,468,528

METHODS AND APPARATUS FOR PROVIDING ENHANCED ANNOUNCEMENTS IN A TELEPHONE SYSTEM

Carla F. Reece, Lafayette Township, Boulder County, and Vincent D. Vanacore, Boulder, both of Colo., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Mar. 24, 1982, Ser. No. 361,312
Int. Cl.³ G11B *31/00*; H04M *3/50*; H04Q *3/66*
U.S. Cl. 179—18 B **3 Claims**



1. A method of holding the interests of a plurality of incoming callers during the time no operator is available to answer their calls incoming simultaneously to a switching system which has at least one operator to answer incoming calls, and which switching system comprises a central processor and a memory for storing data concerning the progress of said incoming calls in the system, the method comprising the steps of:

(1) connecting each of said incoming calls to a predetermined timed sequence of recorded announcements, each of the recorded announcements containing information concerning the handling of an incoming call by the system to assure said incoming callers that their calls will be answered and which information is different from information contained in the other recorded announcements by performing the steps of:

(a) storing a data representation for each one of said incoming calls in service tables located in memory, each service table being associated with a respective recorded announcement, prior to interconnection of that same one call to one of the recorded announcements in the sequence;

(b) scanning each of the service tables in a timed sequence to determine which of said incoming calls are to be connected to the recorded announcement associated with the scanned service table;

(c) connecting each of said incoming calls having a data representation stored in the scanned table to the associated recorded announcement at the beginning of the announcement; and then

(d) removing the stored data representations of said incoming calls from the scanned service table;

(2) storing a different data representation for each of said incoming calls in a lower open position, with one position per data representation, of a queue table located in the memory;

(3) disconnecting an incoming call identified by a data representation stored in the top position of the queue table from the predetermined timed sequence of recorded announcements and connecting said incoming call in said top position to an idle operator when an idle operator becomes available;

(4) removing said data representation of said incoming call in said top position of the queue table from the queue table and from each of the service tables when the associated identified incoming call has been connected to an idle operator; and

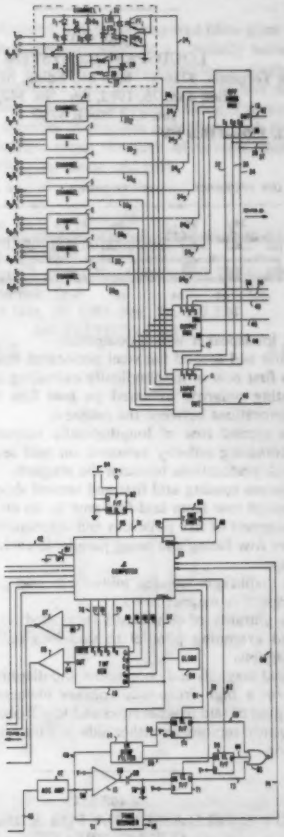
(5) moving each of the remaining data representations identifying calls stored in the queue table up one position in the queue table after said data representation in the top position has been removed.

4,468,529

PROGRAMMABLE AUTOMATIC CALLING SYSTEMS

Richard I. Samuel, Westfield, N.J., and Fred J. Smith, Plantation, Fla., assignors to Jayem Dialer Corp., Westfield, N.J.

Filed Apr. 21, 1982, Ser. No. 370,604
Int. Cl.³ H04M *1/274*, *3/44*, *15/10*
U.S. Cl. 179—18 BA **32 Claims**



1. An improved automatic calling system for selectively outpulsing DTMF tone pairs on any of a plurality of channels in response to a service request signal received from a channel requiring service, said automatic calling system including processor means, tone generator means, and means for selectively interconnecting said processor means and said tone generator means to any of said pluraliity of channels to permit a determination of an off hook condition on any of said plural-

ity of channels and an exchange of tone information, the improvement comprising:

means interconnected to said processor means for providing an output signal thereto indicating a programming operation is about to be initiated;

means in said processor means responsive to said output signal indicating a programming operation is about to be initiated for determining if one of said plurality of channels has been placed in an off hook condition and has applied a predetermined DTMF row or column tone to said processor means; and

means in said processor means responsive to a detection of said one of said plurality of channels being placed in an off hook condition and supplying a single predetermined DTMF row or column tone to said processor means for receiving DTMF tone pairs in sequence from said one of said plurality of channels and storing information corresponding to DTMF tone pairs received as digits of a number sequence to be subsequently outpulsed in response to a service request from any of said plurality of channels.

4,468,530

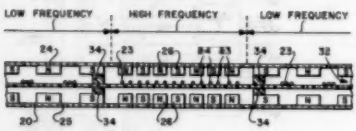
LOUDSPEAKER SYSTEM

W. Lee Torgeson, 4716 W. 60th St., Edina, Minn. 55424

Filed Jan. 25, 1982, Ser. No. 342,469

Int. Cl.³ H04R *9/00*

U.S. Cl. 179—115.5 PV **20 Claims**



1. A loudspeaker which comprises:

(a) first and second flat steel perforated sheets,

(b) a first row of longitudinally extending magnets of alternating polarity, mounted on said first steel sheet with perforations between the magnets,

(c) a second row of longitudinally extending magnets of alternating polarity mounted on said second steel sheet with perforations between the magnets,

(d) means spacing said first and second sheets, to space said second row from said first row by an air gap,

(e) magnets of like polarities and dimensions in said respective row facing and being parallel to each othe across said gap,

(f) a diaphragm situated midway in said gap between said respective magnet rows,

(g) a plurality of conductors supported by said diaphragm and extending parallel to said longitudinally extending magnets,

(h) said magnets and conductors and diaphragm arranged to form a high frequency speaker element in the central region of said magnet rows and low frequency or mid-frequency regions on either side of said high frequency region.

4,468,531

SAFETY SHIELD ASSEMBLY FOR A DRAWOUT-TYPE CIRCUIT BREAKER

James H. Postlethwait, Hartford; William F. Olashaw, and Roger Kusek, both of Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,347

Int. Cl.³ H01H *9/22*

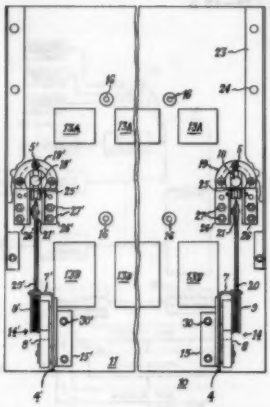
U.S. Cl. 200—50 AA **14 Claims**

1. A shield assembly for circuit breaker compartments comprising:

a pair of fixed and moveable shields arranged for insertion within a circuit breaker compartment, said moveable shield being slideably mounted on said fixed shield;

an actuating probe mounted on said fixed shield and extending forwardly from said fixed shield for contact with a rear portion of a circuit breaker upon insertion of said circuit breaker to within said breaker compartment;

a spring motor attached to said fixed shield for providing a



downward closing force to said moveable shield when said moveable shield is in an upward open position and said actuator probe is in contact with said circuit breaker; and

means connecting said spring motor, said probe and said moveable shield for causing said moveable shield to move downward to a closed position when said circuit breaker is moved out of contact with said probe.

4,468,532

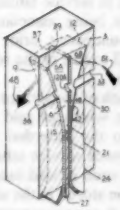
PNEUMATIC REED SWITCH

Paul M. Clark, Middletown; Danny L. Fenwick, Springdale, both of Ohio, and Jon D. Hopkins, Unionville, Conn., assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 22, 1982, Ser. No. 443,827

Int. Cl.³ H01H *35/24, 35/40*

U.S. Cl. 200—81.9 R **9 Claims**



1. An electrical switch comprising:

(a) a housing containing a chamber;

(b) a conductive reed which divides the chamber into a plurality of expansible compartments;

(c) two electrical terminals contained in one of the compartments;

(d) a passage connecting with one of the compartments for introducing fluid into that compartment to change the size of that compartment to urge the reed into contact with both terminals; and

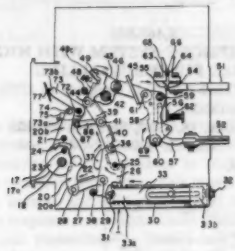
(e) a perforation in the reed for reducing flutter of the reed during the contact established in (d) by allowing fluid to pass through the reed.

4,468,533

AIR CIRCUIT BREAKER

Toshihiko Kodera; Kiyoshi Eguchi; Takayoshi Ishikawa; Yasushi Genba; Shigemi Tamaru, and Susumu Satou, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,794
Claims priority, application Japan, Jan. 29, 1982, 57/14490
Int. Cl.³ H01H *3/46*
U.S. Cl. 200—153 SC 7 Claims



1. In an air circuit breaker including a handle operatively associated with said air circuit breaker for generating a compression force, an energy accumulating spring for effecting closing of electrical contacts in said air circuit breaker, force transmitting means operatively associated with said handle and said energy accumulating spring for transmitting said compression force generated by said handle to said energy accumulating spring for compression thereof, a contact opening and closing mechanism for opening and closing said electrical contacts of said air circuit breaker, a direction changing lever operatively associated with said contact opening and closing mechanism and a link mechanism operatively associated with said direction changing lever and said force transmitting means to transmit said compression force accumulated in said energy accumulating spring to said contact opening and closing mechanism to close said electrical contacts, a rebound prevention device, comprising:

a stopper adapted to cooperate with said direction changing lever such that when said direction changing lever is rotated to an original position by a contact mechanism spring force during an OFF-operation of said air circuit breaker said direction changing lever collidingly contacts said stopper at said original position and is prevented from rotation therepast;

a movable piece pivotally supported on said direction changing lever and contacting said stopper when said direction changing lever collidingly contacts said stopper, said movable piece including an engaging part which stoppingly engages said stopper when inertia of said movable piece pivotally rotates said movable piece into contact with said stopper during said OFF-operation, and wherein said movable piece is adapted to cooperate with said direction changing lever to prevent a rebounding movement of said direction changing lever from said stopper; and

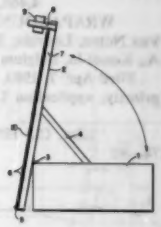
a return spring operatively associated with said movable piece and said direction changing lever and adapted to cooperate with said movable piece such that said movable piece contacts said stopper against a force of said spring.

4,468,534

METHOD AND DEVICE FOR CUTTING GLASS

Franc W. Boddicker, 444 Girard St., #102, Gaithersburg, Md. 20877

Filed Sep. 30, 1982, Ser. No. 430,614
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LG 4 Claims



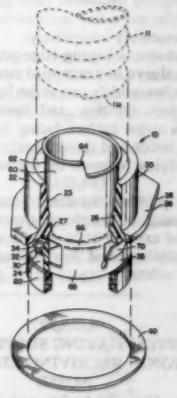
1. A method of cutting a sheet of tempered plate glass which comprises inclining said glass sheet to a generally horizontal, stationary position and continuously directing a single laser beam in a predetermined path perpendicular to and along a path across the glass sheet, said laser beam being of appropriate wavelength and intensity to produce a localized melt through the glass substantially along the path of contact therewith thereby cutting the glass along said path.

4,468,535

SNAP-ON LIQUID TIGHT CONNECTOR FOR FLEXIBLE METAL CONDUIT

Joseph P. Law, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 29, 1981, Ser. No. 335,528
Int. Cl.³ H02G *3/06*
U.S. Cl. 174—65 R 6 Claims



1. A connector for coupling a flexible metallic conduit to an electrical enclosure having an opening comprising:

an elongate housing having a passage therethrough for receiving said conduit, said housing having a wall of inwardly decreasing internal dimension for engaging one end of said conduit therealong in liquid tight relation;

an elongate grounding ferrule supported in said housing and having a first helical end for engaging the interior of said conduit and progressively drawing said conduit one end into said liquid-tight relation with said housing, said grounding ferrule including a plurality of integrally

formed resilient grounding tabs adjacent the end of said ferrule opposite said helical end, for electrically engaging said electrical enclosure adjacent said opening; and

means inclusive of said grounding tabs for resiliently securing said connector in said opening of said electrical enclosure.

4,468,536

WRAPAROUND CLOSURE

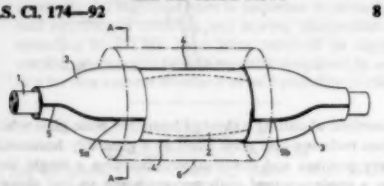
Lodewijk Van Noten, Louvain, Belgium, assignor to N.V. Raychem S.A., Kessel-lo, Belgium

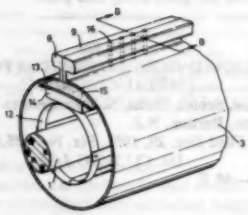
Filed Apr. 7, 1983, Ser. No. 483,017

Claims priority, application United Kingdom, Apr. 8, 1982, 8210572

Int. Cl.³ H02G *15/18*

U.S. Cl. 174—92 **8 Claims**





1. A closure assembly comprising:

a wrap-around sleeve having edge portions which can abut to hold the sleeve in a wrapped configuration;

a sealing member which can underlie and bridge the edge portions when abutting, and having a heat softenable sealant on a major surface facing the edge portions;

urging means inside said sleeve bearing on said sealing member for applying pressure on the sealant when heat softened; and

means which provides localized separation which extends from the inside of the sleeve through the abutting edge portions and extends between the abutting edge portions allowing only localized flow between them of said sealant when heat softened.

4,468,537

SOUND SYSTEM HAVING SUPPRESSION OF AM STEREOPHONIC RECEIVING CIRCUIT-INDUCED NOISE

Tatsuo Numata; Akira Nishioka, and Hitoshi Hirata, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

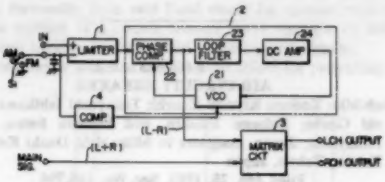
Filed Jun. 17, 1981, Ser. No. 274,613

Claims priority, application Japan, Jun. 19, 1980, 55-83154

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—15 **6 Claims**

1. A multi-function sound system adapted for receiving AM stereophonic broadcast signals of a type in which a carrier is phase-modulated with a sub-signal and amplitude modulated with a main signal, comprising: a limiter for removing amplitude variation components of a received AM stereophonic signal, a received signal being coupled to an input of said limiter; phase detection means for detecting said sub-signal from an output of said limiter; and means for controlling said



limiter to deactivate said limiter in operational modes other than an AM stereophonic receiving mode.

4,468,538

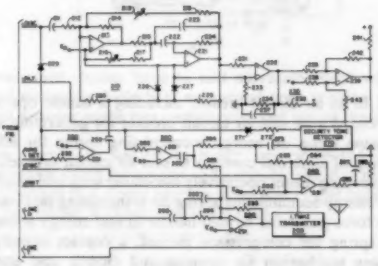
WIRELESS TELEPHONE SYSTEM WITH HIGH LEVEL DIAL PULSE SIGNALLING

Peter K. Cripps, Cranbury, N.J., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Dec. 16, 1982, Ser. No. 450,405

Int. Cl.³ H04Q *7/04*

U.S. Cl. 179—2 EA **12 Claims**



1. A wireless extension telephone system comprising: a remote unit including a radio transmitter, a signal generator operated to produce tone signals of a predetermined frequency, a modulator connected between said generator and said transmitter, operated to modulate said transmitter, said transmitter operated to transmit radio signals modulated at the frequency of said tone signals, amplitude control means connected to said modulator, limiting said modulated radio signals to a first amplitude, a dialing circuit connected to said amplitude control means, operated to generate a selected quantity of dial pulses and on response to each dial pulse, said amplitude control means operated to limit said modulated radio signals to a second amplitude; and a base unit connected to a telephone line including, a radio receiver and dial pulse detection means connected between said receiver and said telephone line operated in response to receipt by said receiver of signals of said second amplitude to pulse said telephone line.

4,468,539

WIRELESS TELEPHONE SYSTEM WITH INTERCOM SIGNALLING AND AUXILIARY STATION

Edward A. Schober, Haddon Heights, N.J., assignor to GTE Automatic Electric Inc., Northlake, Ill.

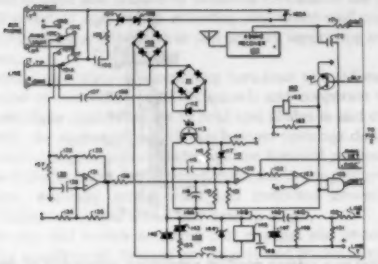
Filed Dec. 16, 1982, Ser. No. 450,406

Int. Cl.³ H04Q *7/04*

U.S. Cl. 179—2 EA **10 Claims**

1. A wireless extension telephone system comprising: an extension unit including a radio receiver and a signal transducer connected to said receiver; a base unit including a signal-

ling circuit and switching means connected to said signalling circuit, manually operated to render said signalling circuit operated, signal generating means, ringing detection means, connected between said signalling circuit and said signal generating means, operated in response to said operated signalling circuit to render said signal generating means operated, a radio transmitter including circuit connections to said ringing detec-



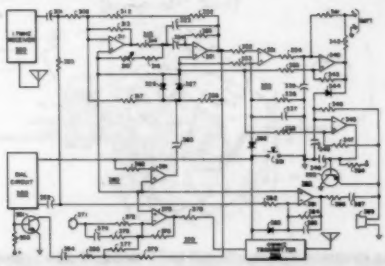
tion means, conditioned in response to operation of said ringing detection means, and said radio transmitter connected to said signal generating means, operated in response to said signal generating means to transmit signals received from said signal generating means; and said receiver at said extension unit operated in response to receipt of said signals transmitted from said base unit transmitter to extend said signals to the said signal transducer.

4,468,540

WIRELESS TELEPHONE SYSTEM WITH COMBINATION FILTER/OSCILLATOR CIRCUIT

Peter K. Cripps, Cranbury, N.J., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Dec. 16, 1982, Ser. No. 450,407
Int. Cl.³ H04Q *7/04*
U.S. Cl. 179—2 EA **14 Claims**



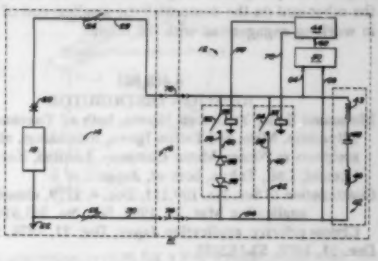
1. A wireless extension telephone system comprising: an extension unit including a first tuned circuit connected to a first radio receiver and to a first radio transmitter, operated in a first mode as a filter to pass signals of a predetermined frequency from said first receiver and operated in a second mode as an oscillator to generate signals of a predetermined frequency and couple said generated signals to said first radio transmitter; and a base unit including a second tuned circuit connected to a second radio receiver and to a second radio transmitter, operated in a first mode as a filter to pass signals of predetermined frequency from said second receiver and operated in a second mode as an oscillator to generate signals of a predetermined frequency and couple said generated signals to said second radio transmitter; said base unit and said extension unit each further including mode control means, operated to switch said associated tuned circuit from said filter mode of operation to said oscillator mode of operation.

4,468,541

TERMINAL EQUIPMENT RING/DING SUPPRESSION CIRCUIT

Sam G. Cohen, Pleasantville, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Jul. 21, 1983, Ser. No. 515,746
Int. Cl.³ H04M *3/38*
U.S. Cl. 179—84 C **15 Claims**



1. Terminal equipment of the type having ring and tip wires from a telephone company central office electrically connected to a terminal bell and adapted to receive a ringing signal for ringing said terminal bell to indicate the presence of an incoming call to said terminal equipment, wherein the terminal equipment comprises:

ringing signal detector means electrically connected across said ring and tip wires and responsive to said ringing signal for detecting said incoming call and adapted to provide control signals in response to said ringing signal,

relay means electrically connected to said ringing signal detector means and responsive to said control signals received from said ringing signal detector means,

ring suppress circuitry including back-to-back zener diodes electrically connected in circuit with said relay means across said ring and tip wires, said ring suppress circuitry controlled by said relay means for completely preventing the ringing of said terminal bell when said ringing signal is detected, and

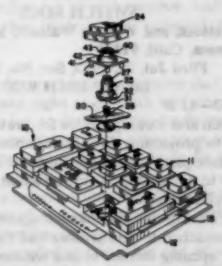
line holding circuitry including an impedance electrically connected in circuit with said relay means across said ring and tip wires, said line holding circuitry controlled by said relay means for answering said incoming call to said terminal equipment.

4,468,542

KEYBOARD ASSEMBLY

Walter R. Pounds, Lafayette, Colo., assignor to KB Denver, Inc., Frederick, Colo.

Filed May 16, 1983, Ser. No. 494,958
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A **11 Claims**



1. In a keyboard assembly having a plurality of key operated

switches, wherein each switch includes a dome mounted on a printed circuit board in association with switch contacts that are closed upon tripping the dome and opened upon releasing the dome, a keycap adapted to be engaged for actuating said dome, and a transmission system between the keycap and dome for transmitting a force applied on the keycap to the dome, the improvement being in said transmission system which includes an actuator on which the keycap is mounted, and a conically shaped coil spring bottoming at one end on the actuator and at the other end on the dome with the smallest end of the spring in working engagement with the dome.

4,468,543

IGNITION DISTRIBUTOR

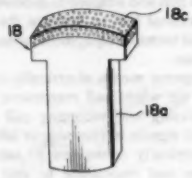
Masazumi Sone; Yukitsugu Hirota, both of Yokohama; Takao Miyashita, Mito, and Tatsuo Igawa, Kitaibaragi, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa and Hitachi, Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 100,111, Dec. 4, 1979, abandoned. This application Mar. 25, 1982, Ser. No. 361,810

Claims priority, application Japan, Dec. 11, 1978, 53-152029; Dec. 11, 1978, 53-152032

Int. Cl.³ F02P *7/02;* **H01H** *19/00*

U.S. Cl. 200—19 DR **5 Claims**



1. A distributor for use in an internal combustion engine including a plurality of cylinders, and spark plugs associated with said respective cylinders, comprising:

(a) stationary electrodes formed of a conductive material and disposed in circumferential spaced relationship, said stationary electrodes electrically connected to said respective spark plugs;

(b) a rotor electrode formed of a conductive material and electrically connected to a power source, said rotor electrode being rotatable to bring its end surface to positions facing said stationary electrodes successively with a narrow gap as said engine rotates, the end surface of said rotor electrode comprising a material capable of being impregnated with a liquid insulator and being so impregnated to form a plurality of finite insulated surfaces and conductive surfaces separately disposed from one another.

4,468,544

SWITCH LOCK

Anamae Wainess, and William Wainess, both of 18354-A Collins, Tarzana, Calif. 91356

Filed Jul. 25, 1983, Ser. No. 517,017

Int. Cl.³ H01H *9/20*

U.S. Cl. 200—42 R **1 Claim**

1. A switch arm locking device for preventing movement of a switch arm projecting through an opening in a switch face plate, said face plate having openings for mounting screws for securement to a plate supporting a switch assembly, said locking device comprising:

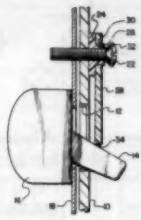
a washer having one side located against said face plate;

a sleeve attached to said washer and extending therefrom;

a washer opening formed in said washer and sleeve in alignment with one of said mounting screw openings in said face plate;

a mounting screw extending through said one mounting screw opening in said sleeve and said washer opening for supporting such on said face plate;

a latch arm pivotally mounted against the other side of said washer, said latch arm having a latch arm opening, said sleeve being located within said latch arm opening, said latch arm having a free outer end, said free outer end being rounded forming a cam surface, said latch arm being



pivotal to a release position permitting movement of said switch arm from its established position; and

said sleeve extending exteriorly of said latch arm, tightening of said mounting screw causes deformation of said sleeve into frictional contact with said latch arm, increasing tightening of said screw increases the frictional connection between said latch arm and said sleeve.

4,468,545

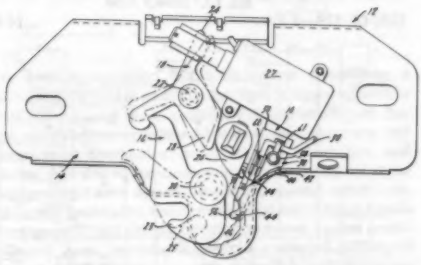
ELECTRICAL SWITCH FOR AUTOMOBILE DECK LID LATCHES AND THE LIKE

Michael Slavin, Troy, Mich., assignor to Lectron Products, Inc., Rochester, Mich.

Filed Sep. 24, 1982, Ser. No. 423,137

Int. Cl.³ H01H *3/00*

U.S. Cl. 200—61.64 **10 Claims**



1. An electrical switch adapted to be mounted on a primary supporting member having a switch mounting surface and to be mechanically engaged by and to have a wiping electrical contact with an associated switch actuating part forming part of an electrical circuit and having a back and forth movement adjacent to said mounting surface, said switch comprising

a case having a bottom seating surface adapted to be supported on the mounting surface of said primary member and to be fastened to the latter in a predetermined position with respect to said switch actuating part;

a plurality of parallel, longitudinal channels in the forward portion of the case opening through the top thereof and through the bottoms of said channels at the forward ends of the latter;

means forming transverse retainer bars at the forward ends of said channels above said bottom openings;

blade retainer means carried by said case rearwardly of said channels; and

a plurality of elongate, flexible and resilient terminal blades,

one for each of said channels, each of said blades having a forward position and a rear terminal portion and being insertable into its respective channel through the bottom opening of the latter and being longitudinally slidable in said channel into engagement with said blade retainer means;

the forward portions of said terminal blades extending under and beyond said transverse retaining bars and in the path of travel of said switch actuating part when said case is mounted on and fastened to said primary supporting member,

whereby said transverse retaining bars limit upward movement of said blades in said channels and cooperate with said blade retainer means to hold said blades in said channels, the rearward ends of said bottom openings defining bearing edges for said blades and the forward portions of said blades being cantilevered from said bearing edges for free, normally unsupported and restricted downward flexing movement about said bearing edges,

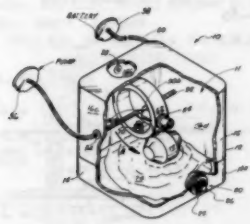
whereby said switch actuating part engages and overrides the cantilevered forward portions of said blades in use to flex the same downwardly about said bearing edges with a soft action that results in a relatively long life for the switch and at the same time provides an effective electrical contact between the blade and said switch actuating part.

4,468,546

BILGE PUMP ACTIVATOR SWITCH

Clarence L. Jones, Houma, La., assignor to Pitre-Jones, Inc., Houma, La.

Filed May 23, 1983, Ser. No. 497,310
Int. Cl.³ H01H *35/18*
U.S. Cl. 200—84 B **17 Claims**



1. A bilge pump switch apparatus for activating and deactivating the bilge pump of a vessel comprising:

a. a housing defining a chamber therein and provided with a fluid port communicating with the bilge of said vessel;

b. a mercury tilt switch provided within said chamber being responsive to tilting for opening and closing its circuit;

c. means operatively connected with said mercury switch responsive to the fluid level within said chamber for positioning said mercury tilt switch in a first position whereby its circuit is normally opened and in a second position whereby its circuit is normally closed;

d. a source of electrical power external to said housing;

e. a circuit comprising said source of electrical power, said mercury tilt switch and said bilge pump; and

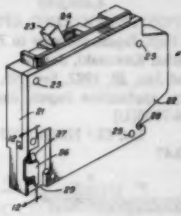
f. means to create a vacuum retard of expulsion of fluid from said housing, said fluid maintaining said mercury tilt switch in said second closed position for an extended period.

4,468,547

BUS BAR CONNECTOR SYSTEM

Harold E. Belttary, Colinas de Monte Carlo, P.R., assignor to Challenger Caribbean Corporation, Canovanas, P.R. and Commander Electrical Equipment, Inc., Scarborough, Canada

Filed Jan. 27, 1983, Ser. No. 461,410
Int. Cl.³ H01H *9/08*
U.S. Cl. 200—294 **5 Claims**



1. A bus bar connector system for a low voltage residential type circuit breaker comprising

(A) a molded, hollow, circuit breaker housing having a front, a back, one side, an opposite side, one end, and an opposite end, including

(1) a first opening in said front for an operating handle to pass therethrough,

(2) a support within said housing at said one end of said back of said housing at said one side thereof; and

(3) a second opening at said one end of said back of said housing at said opposite side thereof, so that said support at said one side is oriented intermediate said second opening at said opposite side, said second opening extending along said one end of said opposite side from a position proximal to said back to a location between said front and said back of said opposite side,

(B) a spring clip of generally U-shape configuration having

(1) an outer leg, relatively stiff, with smoothly formed edges, said outer leg having an inner surface,

(2) a bight of said U-shaped spring clip, coupled to said outer leg, and

(3) an inner leg, having portions removed so as to produce two flat springs joined by a portion of a flat leg, said flat leg being coupled to said bight of said U-shaped spring clip, said flat leg being adapted to cooperate with said support so as to rigidly position said bight of said U-shaped spring clip and said outer leg relative to said circuit breaker housing; and

(C) a conductive contact member having

(1) an outer conductive leg, having a connecting surface, one end, and an opposite end, commensurate in length and width with said outer leg of said spring clip so that when said inner surface of said outer leg of said spring clip is positioned opposite to said connecting surface of said outer conductive leg of said member, and spaced therefrom, a bus bar blade can be received therebetween,

(2) a step having

(i) a riser along a first orthogonal direction that joins at a roundly formed right angle with said one end of said conductive leg, so that said roundly formed right angle and said smoothly formed edges serve as "lead-in" contours for said bus bar blade to be inserted therebetween, said

(ii) a tread along a second orthogonal direction adapted to rest upon one of said two flat springs, and

(3) a formed configuration having

(i) a first portion coupled to said other end of said conductive leg and oriented in a direction parallel to said riser,

(ii) a second portion coupled to said first portion, paral-

lel to said riser, extending along a third orthogonal direction, and

(iii) a third portion, coupled to said second portion and perpendicular thereto, adapted to house a fixed contact,

said second portion having an aperture therewithin for receiving the other of said two flat springs.

4,468,548

COMPOSITE COOKING APPARATUS

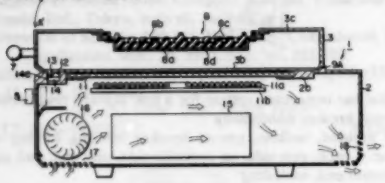
Mitsuo Yamaki, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

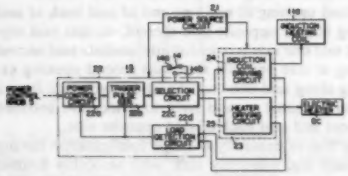
Filed Jan. 20, 1982, Ser. No. 341,172

Claims priority, application Japan, Jan. 23, 1981, 56-8779; Jan. 23, 1981, 56-7988[U]

Int. Cl.³ H05B *9/02*

U.S. Cl. 219—10.47 **7 Claims**





1. A composite cooking apparatus comprising an upper casing including a first heating section provided at the top thereof; at least a lower casing including a second heating section provided at the top thereof, said upper casing being hinged to said lower casing such that the former can be opened and closed with respect to the latter, one of said first and second heating sections having an induction heater while the other of said first and second heating sections has an electric heater; means for driving said induction heater; means for driving said electric heater; and control means for controlling the operation of said induction heater driving means and said electric heater driving means, said control means including a power control circuit, a trigger pulse generator for generating a trigger pulse in response to an output signal of said power control circuit, and a selection circuit for selectively providing the trigger pulse to said induction heater driving means and said electric heater driving means.

4,468,549

INDUCTION HEATER ARRANGEMENT FOR FORGING BAR STOCK

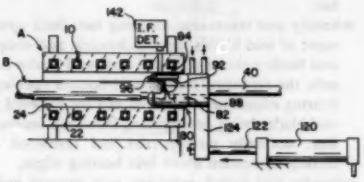
Joseph E. Arnosky, Boaz, Ala., assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed May 27, 1982, Ser. No. 382,372

Int. Cl.³ H05B *6/40*

U.S. Cl. 219—10.77 **25 Claims**

1. An induction heating apparatus for heating an end length portion of an elongated workpiece to a processing temperature during a heating cycle of said apparatus, said end length portion having a terminal end residually heated from a prior heating cycle and an axial length substantially less than said end length portion, said apparatus comprising: an inductor having a multiturn heating coil with a linear coil axis and a workpiece-receiving passageway coaxial with said coil for accommodating the said end length portion entirely therewithin; said passageway having an open front end at one end of said coil through which the workpiece is inserted residually heated end first, into said passageway and an open rear end at the other end of said coil, a movable flux diverter ring of high electrical conductivity, low permeability material and normally located in an inoperative position outside and adjacent the said rear



end of said coil passageway, and means mounting said flux diverter ring for movement from said inoperative position into the said rear end of and axially aligned with said passageway and moving said ring to an operative position therein surrounding the said residually heated terminal end of the workpiece, during one or more portions of said heating cycle, to divert the flux generated by the energized coil away from said heated terminal end and prevent heating thereof during said heating cycle portion or portions.

4,468,550

MULTISPOTWELDING MACHINE FOR THE PRODUCTION OF GRIDS OR GRATINGS

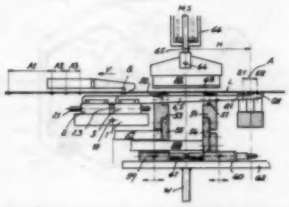
Hans Gött; Rudolf Scherr; Josef Ritter; Klaus Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwicklungs-und Verwertungs-Gesellschaft mbH., Graz, Austria

Filed Jul. 13, 1982, Ser. No. 397,826

Claims priority, application Austria, Jul. 28, 1981, 3328/81

Int. Cl.³ B23K *11/00*

U.S. Cl. 219—56 **12 Claims**



1. A multispotwelding machine for the production of grids or gratings of longitudinal members and crosswires crossing said longitudinal members, said machine having a welding electrode system suitable for making double spotwelds at two longitudinally variably spaced weld lines where two of said crosswires cross said longitudinal members, two wire-guides arranged at a fixed distance apart on feed lines for the simultaneous feeding in of two of said crosswires, crosswire transfer tools arranged on a common bearer, means for shifting said bearer by a stroke corresponding with a distance of the plane of symmetry midway between said feed lines from the plane of symmetry midway between said lines of weld, and means for the forward feed of said grid or grating after each welding operation, including two of said crosswire transfer tools each for transferring one of said crosswires from a respective one of said feed lines to a corresponding one of said weld lines, and

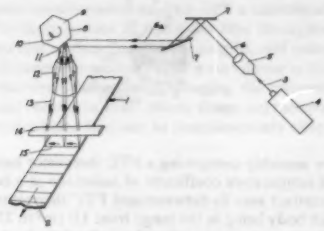
means are provided for shifting said tools on said bearer in opposite senses so the strokes of said tools are greater and smaller by equal amounts than that of said bearer.

4,468,551

LASER TREATMENT OF ELECTRICAL STEEL AND OPTICAL SCANNING ASSEMBLY THEREFOR

Gary L. Nelheisel, Cincinnati, Ohio, assignor to Armco Inc., Middletown, Ohio

Filed Jul. 30, 1982, Ser. No. 403,790
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 L **20 Claims**



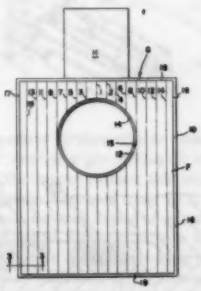
1. In apparatus for the continuous manufacturing of an indefinite length strip of magnetic material of the type having a plurality of magnetic domains and an insulative coating thereon, said strip moving at a substantially constant speed, the improvement in combination therewith comprising a laser producing a laser beam, and means for focusing said beam onto the surface of the moving strip so as to produce in the strip a narrow line of subdivided magnetic domains without damage to the insulative coating.

4,468,552

METHOD OF APPLYING HARD SURFACES TO GATE VALVES AND THE LIKE

John D. Morley, Bay City, Mich., assignor to Advanced Technologies, Inc., Bay City, Mich.

Filed Sep. 29, 1982, Ser. No. 428,369
Int. Cl.³ B23K *15/00*
U.S. Cl. 219—121 EC **8 Claims**



1. A method of applying hard surfaces to gate valves having openings therein, and like generally planar metallic bodies which are subject to hard wear, comprising the steps of:

a. forming a relatively thin generally planar facing plate relative to the thickness of the body to be protected of a harder, more wear-resistant metal and in a size to serve as a planar facing which has a face surface and edges for the body;

b. applying the facing plate to the face of the body to provide an assembly to be welded; and

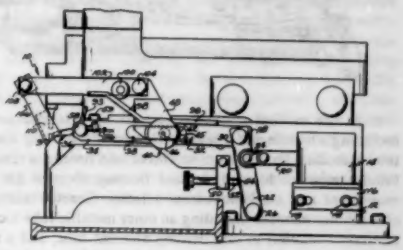
c. directing a series of high power density welding beams of high energy electrons at the face surface of said facing plate while moving the beams and assembly relatively in passes wherein the welds effected span the facing to secure the relatively thin plate to the body in a manner to avoid surface cracks, porosity and warpage to provide a hard wear-resistant facing for said body.

4,468,553

AUTOMATIC CHAIN WELDING APPARATUS

Carl H. Brastow, Foxboro, Mass., and Joel D. Mallett, Warwick, R.I., assignors to Conceptual Engineering Associates, Inc., Foxboro, Mass.

Filed Apr. 13, 1982, Ser. No. 367,942
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—51 **23 Claims**



21. A chain making apparatus having a cycle of operation which includes clamping a wire and bending a portion thereof into a loop, severing the loop from the remainder of the wire, means closing the loop and inserting the severed end of the remainder of the wire through the loop characterized in that electrode head supporting means is mounted so that an electrode is brought into a selected location adjacent the ends of a closed loop each cycle of the operation of the apparatus, the supporting means comprising an arm having a first electrode head supporting end and a second cam follower end, the arm pivotably mounted intermediate its ends, an elongated, generally tubular electrode head having an electrically insulative sleeve with an open tip end, the tip end having a face, the electrode disposed within the sleeve spaced therefrom and spaced inwardly of the face, a cam attached to the chain making apparatus with the cam follower biased into contact with the cam, the cam having a profile selected so that the arm is caused to pivot bringing the tip end of the electrode head into the selected location adjacent the ends of a closed loop for a selected portion of a revolution of the cam, the electrode head supporting means including a vertical adjusting block having a bore extending therethrough, the bore receiving therein the elongated sleeve, hook means extending laterally from the vertical adjusting block, a target adjusting block having a top portion and a top surface thereof, a rod extending upwardly from the top surface of the top portion of the target adjusting block, a collar disposed on the rod and adjustably movable along the length of the rod, the elongated sleeve and the vertical adjusting block adapted to be pivoted with the hook means engageable with the rod and collar.

4,468,554

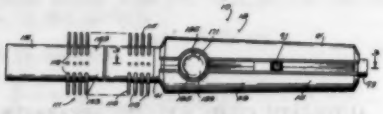
ELECTRIC HAIR CURLING APPLIANCE HAVING A SELECTIVELY ROTATABLE REMOVABLE HAIR GROOMING MEMBER

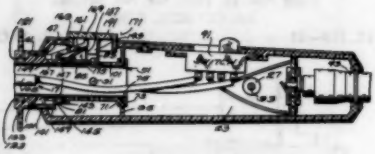
Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Continuation-in-part of Ser. No. 59,676, Jul. 23, 1979, abandoned, Ser. No. 120,511, Feb. 11, 1980, Pat. No. 4,358,660, Ser. No. 222,590, Jan. 5, 1981, Pat. No. 4,368,376, Ser. No. 278,192, Jun. 29, 1981, , and Ser. No. 415,372, Sep. 7, 1982,. This application Oct. 25, 1982, Ser. No. 436,595

Int. Cl.³ H05B *3/40;* **A45D** *2/36;* **A46B** *7/10*

U.S. Cl. 219—222 **12 Claims**





1. A hair curling appliance comprising a handle assembly including a handle and a heating element comprising a metallic tube extending fixedly from an end of said handle, a removable tubular member located on said heating element for rotary movement and axial movement relative thereto, said removable tubular member including an inner metallic tube located in telescopic relation to said heating element tube, and a removable grooming attachment received on said inner metallic tube, and means on said handle assembly and on said tubular member and manually operable selectively while said handle is grasped during use of the appliance for preventing axial and rotary movement of said tubular member relative to said handle assembly, for preventing axial movement of said tubular member relative to said handle assembly, while permitting rotary movement of said tubular member relative to said handle assembly, and for permitting axial and rotary movement of said tubular member relative to said handle assembly to facilitate assembly and disassembly of said tubular member and said handle assembly, said selectively operable means including cooperating surfaces located on said handle assembly and on said tubular member and extending radially and axially in selectively releasable abutting engagement to prevent relative rotary movement between said tubular member and said handle assembly.

4,468,555

ELECTRIC SOLDERING IRON HAVING A PTC HEATING ELEMENT

Shichiro Adachi, and Sho Kotani, both of Tokyo, Japan, assignors to TDK Corporation, Japan

Filed Aug. 26, 1981, Ser. No. 296,444

Claims priority, application Japan, Aug. 31, 1980, 55-123819[U]; Aug. 31, 1980, 55-123820[U]; Aug. 31, 1980, 55-123821[U]; Sep. 3, 1980, 55-125150[U]; Apr. 3, 1981, 56-48123[U]; May 7, 1981, 56-66055[U]

Int. Cl.³ B23K *3/02;* **H01C** *7/02;* **H05B** *3/14*

U.S. Cl. 219—237 **6 Claims**

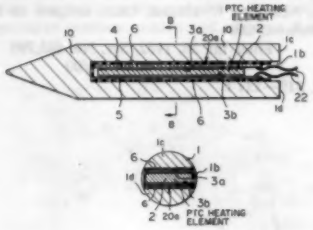
1. A soldering iron comprising:

an elongated bit with a cone shaped bit tip and an elongated cylindrically-shaped back body having an empty region;

a heater assembly mounted in said region of the bit and thermally contacting the back body in said empty region;

a lead wire coupled with said heater assembly to supply power to the soldering iron;

a hand-grip coupled with the bit;



said heater assembly comprising a PTC thermistor having a positive temperature coefficient of resistance as a heater;

the total contact area S_1 between said PTC thermistor and said back body being in the range from 1.0 cm^2 to 25 cm^2, and the transverse cross sectional area S_2 of the back body which contacts said PTC thermistor being in the range from 0.1 cm^2 to 3.0 cm^2.

4,468,556

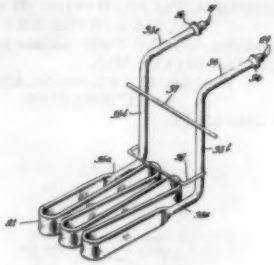
ELECTRIC HEATING ELEMENTS

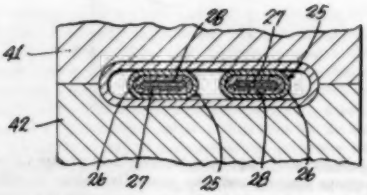
Donald M. Cunningham, Pittsburgh, and John C. Stover, Verona, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 9, 1982, Ser. No. 406,351

Int. Cl.³ H05B *3/06*

U.S. Cl. 219—523 **9 Claims**





1. An electric heater assembly comprising:

an elongated outer metal tube,

a plurality of tubular electric heating elements, each of a transverse size smaller than the opening through said

outer tube, and each comprising an elongated metal sheath, a resistance conductor extending longitudinally within said sheath, thermally-conductive material supporting said resistance conductor within said sheath in manner electrically insulated therefrom, and terminal pins attached to opposite ends of said resistance conductor and extending outwardly of opposite ends of said sheath,

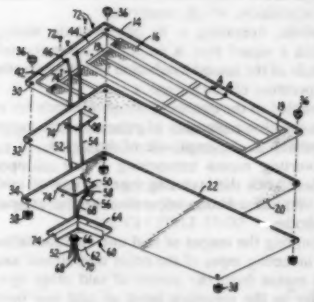
said tubular heating elements being disposed longitudinally within said outer tube in a side-by-side relation and held therein and in good heat-transfer relation therewith by tranverse deformation of said outer tube and said tubular heating elements sufficient to force a substantial portion of the outer surface of the sheaths of said heating elements into metal-to-metal contact with a substantial portion of the inner surface of said outer tube throughout at least a portion of their coextensive lengths, said outer tube being of transverse section which is curvilinear in shape and said transverse deformation changing the transverse shape of said outer tube to an oblong shape and the cross section of said tubular elements to complementary oblong shape.

4,468,557

CONFORMABLE ELECTRIC HEATING APPARATUS

Robert O. Bylin, Belmont, and Stephen J. Bourdette, Fremont, both of Calif., assignors to Bylin Heating Systems, Inc., Redwood City, Calif.

Filed Feb. 3, 1983, Ser. No. 463,350
Int. Cl.³ H05B 3/36
U.S. Cl. 219—535 **4 Claims**



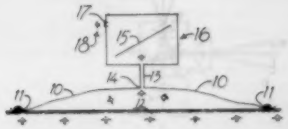
1. Heating apparatus conformable to a curved surface comprising a flexible insulative ply having an outer face adapted for contact with the curved surface, said insulative ply having an inner face opposite from said outer face, an elongate resistive heating element adhered to said inner surface, an insulative lamination substantially coestensive with said insulative ply and being adhered to said resistive heating element and to the inner surface of said insulative ply, a substantially impervious conductive sheet substantially coextensive with said insulative ply adhered to said insulative lamination, said heating element being spaced inward of the edge margin of said apparatus to form four corner margin areas constituted by said ply, lamination and sheet, a set of registered holes formed in each said marginal corner area for facilitating installation of said apparatus and a conductive grommet disposed in each said hole set in physical and electric contact with said conductive sheet, and connecting means for applying power to said resistive heating element and for grounding said conductive sheet.

4,468,558

METHOD AND APPARATUS FOR MEASURING RADON BENEATH AND ABOVE THE LEVEL OF THE GROUND

Erik L. Malmqvist, Skelleftea, and Krister Kristiansson, Lund, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Sep. 29, 1981, Ser. No. 306,720
Claims priority, application Sweden, Oct. 20, 1980, 8007338
Int. Cl.³ G01V 5/00
U.S. Cl. 250—253 **8 Claims**



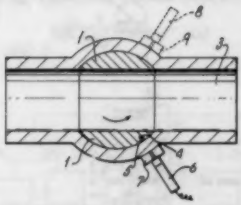
1. A method for measuring at least one of the parameters flow rate, velocity, concentration and quantity of radon and/or radon daughters in the ground, comprising collecting gas emanating from the ground in a first chamber which is permeable to gas only at the bottom thereof, at least the downwardly extending boundaries of said first chamber being in contact with the ground, so that atmospheric air is prevented from passing into said first chamber; placing at least one detector capable of measuring alpha-radiation from the decomposition of radon and radon daughters in a second chamber communicating with said first chamber, the second chamber being located easily accessible so that the detector can be readily observed and utilized for said measuring operation; and causing the gas to pass continuously through the first and second chambers and exiting from the second chamber over a given period of time, in order to expose the gas to said detector; measuring the gas exposed to the detector and evaluating the measured result subsequent to said exposure.

4,468,559

DETERMINING VALVE POSITION

James A. Hurst, and Peter Jackson, both of Stockton-On-Tees, England, assignors to Imperial Chemical Industries, PLC, London, England

Filed Apr. 7, 1982, Ser. No. 366,349
Claims priority, application United Kingdom, Apr. 15, 1981, 8112006; May 19, 1981, 8115254; Feb. 1, 1982, 8202857
Int. Cl.³ G21H 5/02; F16K 37/00
U.S. Cl. 250—303 **12 Claims**

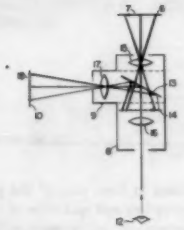


1. A method for determining the position of a valve comprises locating a radioactive source proximally of a valve and monitoring radiation from the source with a detector therefor located proximally of an external surface of the valve, the relative position and alignment of the source and detector being so chosen that the count rate detected by the detector is indicative of the position of the valve.

4,468,560
ELECTRON MICROSCOPE EQUIPPED WITH MEASURING FACILITY

Morioki Kubozoe; Hisasi Satow, both of Katsuta, Japan, and John E. Johnson, Jr., Baltimore, Md., assignors to Hitachi, Ltd. and Nissei Sangyo America, Ltd., both of Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,018
Int. Cl.³ G01N *23/04*; H01K *37/26*
U.S. Cl. 250—311 **11 Claims**



1. An electron microscope equipped with a measuring facility, comprising:

means for forming an electron-microscope of a specimen;

a fluorescent screen for displaying said electron-microscopic image;

an optical microscope including means for observing said electron-microscopic image displayed on said fluorescent screen through an eyepiece;

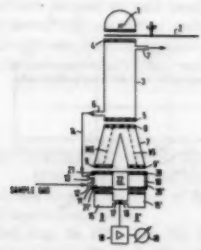
means for forming at least one pattern to be superposed onto said electron-microscopic image for effecting measurements of said electron-microscopic image; and

means associated with said eyepiece for imaging said pattern on an object plane of said eyepiece simultaneously with the image displayed on said fluorescent screen so that said pattern and said electron microscopic image may be viewed in superposition.

4,468,561
NONDISPERSIVE INFRARED GAS ANALYZER

Winfried Speeter, Herxheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 218,771, Dec. 22, 1980, abandoned. This application Jan. 24, 1983, Ser. No. 460,258
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1979, 2952464
Int. Cl.³ G01N *21/25*
U.S. Cl. 250—345 **5 Claims**

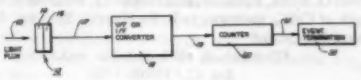


1. An infrared gas analyzer for measuring at least one component gas of a sample gas mixture, the infrared gas analyzer being of the type having a measuring ray path and a reference ray path along which an infrared measuring ray and an infrared reference ray are respectively propagated, the infrared measuring and reference rays each being periodically interrupted; a measuring cell through which the sample gas mixture flows and the infrared measuring and reference rays are propagated; a selectivity cell containing the component gas which is desired to be measured in the reference ray path; a compensation cell for holding a gas in the measuring ray path; and a selective detector for producing a signal corresponding to a difference between the attenuation of the infrared measuring ray after it propagates along the measuring ray path, and the infrared reference ray after it propagates along the reference ray path; the infrared gas analyzer further comprising an inlet and an outlet on the compensation cell for permitting a continuous flow of the sample gas mixture through the compensation cell such that the infrared measuring ray, after being propagated through the measuring cell, is attenuated by interfering component gases in the compensation cell, said interfering component gases being present in the compensation cell in proportional concentrations which vary directly with the proportional concentrations of interfering component gases in the measuring cell.

4,468,562
DOSIMETER FOR PHOTOMETRIC APPLICATIONS

Michael F. Wicnienski, Antioch, and Donald E. Charles, Lake Zurich, both of Ill., assignors to Baxter Travenol Laboratories, Inc.

Filed Jun. 17, 1982, Ser. No. 389,430
Int. Cl.³ G01J *1/44*
U.S. Cl. 250—372 **4 Claims**



1. A temperature independent dosimeter for measuring an amount of irradiation, which comprises:

a photodiode, operating in its photovoltaic mode, which produces a signal that is amplitude-proportional to the amplitude of the sensed irradiation and is substantially free of temperature effects;

means coupled to the output of the photodiode for converting the signal to a plurality of pulses that are proportional in frequency to the amplitude of the signal;

said converting means comprising a pair of operational amplifiers, with the inverting input of one of said operational amplifiers being responsive to the output of the photodiode;

means coupling the output of said one operational amplifier to the inverting input of the other operational amplifier;

feedback means from the output of said other operational amplifier to the inverting input of said one operational amplifier;

means for counting said pulses; and

means for terminating the irradiation when the count reaches a predetermined amount.

4,468,563
ELECTRON LENS

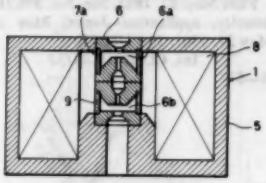
Katsushige Tsuno, and Katsuyoshi Ueno, both of Akishimashi, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,702
Claims priority, application Japan, Jul. 6, 1981, 56-105363
Int. Cl.³ H01J *37/00*
U.S. Cl. 250—396 ML **5 Claims**

1. In a charged particle beam magnetic lens comprising a structure defining a lens axis for being aligned with the electro-optical axis of the particle beam, said structure including an annular electric coil arranged coaxially around the lens axis for producing a magnetizing force (amp-turns) when electrical current passes through the coil, a yoke structure comprising a

low reluctance material surrounding the coil, said yoke having a plurality of annular lens gaps facing the lens axis such that the magnetic flux (B) resulting from the magnetizing force is substantially confined within the low reluctance pathway provided by the yoke except at the lens gaps, the improvement comprising:

a ferromagnetic shunt within at least one but not all of said annular lens gaps, said ferromagnetic shunt sized and



configured to confine substantially all the magnetic flux therein and to prevent lens action in the gap so long as the magnetizing force (amp-turns) due to the exciting current flowing in the coil does not drive the shunt into magnetic saturation and said ferromagnetic shunt permitting magnetic flux inwardly of the gap to cause lens action after the magnetizing force exceeds the value that causes magnetic saturation of the shunt thus increasing the number of gaps in the lens providing lens action.

4,468,564

ION SOURCE

Robert Boyer, Pierrelatte, and Jean-Pierre Journoux, Pierre, both of France, assignors to Commissariat a l'Energie Atomique, France

Filed Oct. 18, 1982, Ser. No. 434,834

Claims priority, application France, Oct. 21, 1981, 81 19761

Int. Cl.³ H01J 27/00

U.S. Cl. 250—427 **4 Claims**

1. An ion source comprising a gas ionization chamber and in said chamber at least one electron source, means for oscillating the electrons from the source in a predetermined direction, so as to produce an ionization zone of the gas, and means for collecting the ions produced, wherein the means for oscillating the electrons comprise two identical facing electron lenses, whose axes coincide with the predetermined direction, two concave spherical mirrors turned towards one another and positioned respectively on either side of the two lenses in such a way that their centres respectively coincide with the foci of the lenses, the electron source being located at the focus of one of the two lenses.

4,468,565

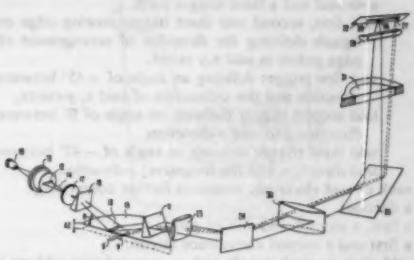
AUTOMATIC FOCUS AND DEFLECTION CORRECTION IN E-BEAM SYSTEM USING OPTICAL TARGET HEIGHT MEASUREMENTS

William W. Blair, Stormville; Samuel K. Doran, Wappingers Falls, and Guenther O. Langner, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,204

Int. Cl.³ B23Q 15/12; G01B 11/14

U.S. Cl. 250—491.1 **11 Claims**



1. An E-beam autofocusing system for correcting E-beam focus as a function of variations between a target surface and a reference point, comprising:

a source of light;

first optical means for projecting an image using light from said source onto said target surface;

second optical means for redirecting said image from said target surface onto an image plane;

transducer means positioned on said image plane receiving said image and producing an electronic output signal indicative of the height of said target surface relative to said reference point; and

circuit means coupled to said transducer means for converting said electronic output signal into a focus correction signal for said E-beam.

4,468,566

CORPUSCULAR BEAM CONTROL CIRCUIT ARRANGEMENT

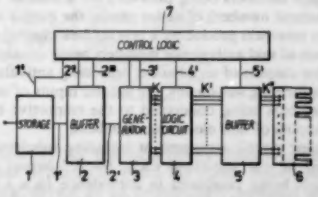
Hans-Günther Eichhorn, 18, Fritz-Ritter-Strasse, 6902 Jena-Lobeda, District of Gera, and Jürgen Gramss, 49, Pfälzer Strasse, 6900 Jena, District of Gera, both of German Democratic Rep.

Filed Jul. 29, 1982, Ser. No. 402,228

Claims priority, application German Democratic Rep., Aug. 3, 1981, 232305

Int. Cl.³ H01J 37/302

U.S. Cl. 250—492.2 **6 Claims**



1. A digital circuit arrangement for control of a corpuscular beam in the course of producing structurized areas by use of corpuscular irradiation devices, particularly operating with linearly extended multi-deflection systems including a plurality

of deflection electrodes for bright/dark modulation for processing of said geometrical areas in columns, comprising

an x, y-raster, figure points defining said geometrical areas in said x,y-raster,

said figure points being constituted of edge points and corner points,

a generating means comprised of a plurality of electronic members,

said electronic members being for producing columns,

said columns containing said edge points,

said plurality of electronic members corresponding in number to said number of deflection electrodes,

said electronic members including a first,

a second and a third trigger each,

said first, second and third trigger storing edge control signals defining the direction of arrangement of said edge points in said x,y raster,

said first trigger defining an angle of +45° between said direction and the x-direction of said x, y-raster,

said second trigger defining an angle of 0° between said direction and said x-direction,

said third trigger defining an angle of −45° between said direction and the (negative) x-direction,

each of said electronic members further comprising

a decoder,

a first, a second, and a third gate,

a first and a second antivalence circuit,

said edge control signals and an y-coordinate address signal from said decoder and a write-in clockpulse from said decoder being simultaneously connected to the set and reset inputs of each of said triggers via a respective gate of said first, second and third gate in each of said electronic components,

the clockpulse inputs of said first and said third trigger of each of said electronic members being connected via a clockpulse bus line to perform a raster-step in x-direction,

the outputs of said first and second trigger being connected to the inputs of a first antivalence gate,

the output of said first antivalence gate and the output of said third trigger being connected to the inputs of a second antivalence gate, the output of said second antivalence gate being the edge point signal output of each of said electronic components,

said electronic members being further columnwise connected to form a first and a second shift register,

said first shift register being constituted in that the outputs of each of said first triggers of said electronic members being connected to the data input of said first triggers in adjacent of said electronic members,

said second shift register being constituted in that the data input of said third triggers in said electronic members being connected to the output of said third trigger in adjacent of said electronic members,

the inputs of the respective first electronic members in the column of electronic members being on logic "zero",

a logic circuit arrangement being connected to said generating means for producing of complete bit pattern columns out of the edge point signals from the columnwise arrangement of electronic members said logic circuit arrangement being for producing a bright/dark control signal for each raster pixel wherein first antivalence members being provided, one of said antivalence members being provided for a number 2^m (where m is a natural number) of raster pixels, the output of said antivalence members producing a bright/dark control signal, the first inputs of said antivalence members being connected to the respective outputs of an adjacent preceding antivalence member, thus forming sub-chains, the second inputs of said antivalence members being connected to the respective edge point signal outputs of said electronic members,

said logic circuit arrangement including subcircuits constituted of one sub-chain each, the 2^m output signals of which being combined in antivalence to a a subcircuit output signal, the first input of the first antivalence gate in each sub-chain being a carry input,

pairs of adjacent of said subcircuits being combined to form a higher order subcircuit by connecting in pairs subcircuit output signals to carry inputs of subsequent subcircuits, the carry inputs of each of said subcircuits being controlled by the antivalence combination of all edge point signals operative before said subcircuits.

4,468,567

LIQUID LEVEL DETECTING DEVICE AND METHOD FOR PRODUCING THE SAME

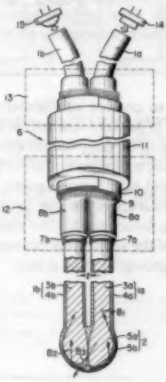
Naoshige Sasano, and Nobuo Kowata, both of Sagamihara, Japan, assignors to Showa Electric Wire & Cable Co., Ltd., Kanagawa, Japan

Filed May 17, 1982, Ser. No. 378,715

Claims priority, application Japan, May 21, 1981, 56-73780[U]; May 21, 1981, 56-73781[U]

Int. Cl.³ G01F *23/22*

U.S. Cl. 250—577 **7 Claims**



1. A liquid level detecting device comprising:

(a) a plurality of optical fibers, their end portions arranged in close vicinity to one another, each having a core made of a transparent material and a cladding layer covering said core therewith and made of another transparent material having a lower refractive index than that of the former transparent material forming said core; and

(b) a detecting portion composed of an inner substantially spherical body formed by heating mutually adjacent end portions of said optical fibers to fuse with one another and made of the same material as that of the transparent material forming said core, said inner spherical body being in one body with said cores; and a cladding layer covering said inner spherical body made of the same material as that of the transparent material forming said cladding layers of said optical fibers and forming a continuous layer with each cladding layer of said optical fibers.

4,468,568

GENERATING POWER FROM THE OCEAN UTILIZING THE THERMAL PROPERTIES OF MAGNETIC MATERIAL

Walter J. Carr, Jr., 1460 Jefferson Heights, and Robert C. Miller, 1746 Williamsburg, both of Pittsburgh, Pa. 15235

Filed Jul. 2, 1982, Ser. No. 394,668

Int. Cl.³ F03G *7/04*

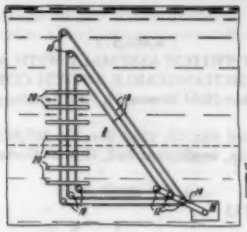
U.S. Cl. 290—1 R **12 Claims**

1. A device for using ferromagnetic material to generate electrical energy, comprising:

a water reservoir having a temperature differential between the surface thereof and at various depths thereat;

at least one ferromagnetic tape means rotatably disposed around a plurality of rotational means for producing different magnetization at different temperatures, said ferromagnetic tape means forming a continuous loop;

plurality of rotational means disposed in said water reservoir for permitting the rotation of said ferromagnetic tape means about the axis of each rotational means, said plurality of rotational means having at least one first rotational means disposed at a depth in said reservoir which is different than that of at least one second rotational means, each rotational means being rotated about its own axis by movement of said tape means;



at least one magnetic field means surrounding a first portion of said tape means for moving by magnetic attraction a second portion of said tape means, said second portion of said tape being at a temperature different than said first portion and therefore having greater magnetization than said first portion; and

electrical power generation means attached to at least one rotational means for producing electrical energy upon the rotation of said tape means.

4,468,569

MEANS OF IMPROVING THE UTILIZATION OF ENERGY AVAILABLE FROM A SOLAR ELECTRIC GENERATOR

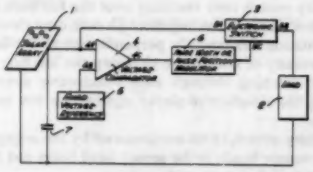
Edgar T. Norris, Toowoomba, Australia, assignor to Toowoomba Foundry Pty. Ltd., Queensland, Australia

Filed Sep. 13, 1982, Ser. No. 417,825

Claims priority, application Australia, Oct. 9, 1981, PF1124

Int. Cl.³ H03K *3/295;* H02H *3/08;* G05F *1/56, 5/00*

U.S. Cl. 290—1 R **8 Claims**



1. Apparatus for matching the electrical impedance of a solar electric generator and a load driven therefrom, comprising:

circuit means for comparing the generator voltage and a predetermined voltage to produce a difference signal indicative of the difference if any in said voltages,

control means for repetitively switching on and off the current flow from the generator to the load, the control means being responsive to the difference signal to vary the duration that said current is switched on relative to the duration that said current is switched off so as to maintain the generator voltage at a substantially constant level, and

storage means for storing energy generated by the generator during the periods that current is switched off the load.

4,468,570

HYDRAULIC DYNAMIC ELECTRIC MACHINE

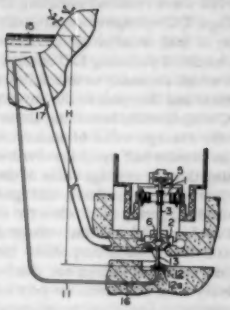
Kengo Takahashi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 13, 1982, Ser. No. 368,000

Claims priority, application Japan, Apr. 14, 1981, 56-55991

Int. Cl.³ F03B *11/06;* H02K *7/08*

U.S. Cl. 290—52 **7 Claims**



1. A hydraulic dynamic electric machine comprising: a rotary shaft having a vertical axis, an electromagnetic means provided on an upper portion of the rotary shaft, a water wheel connected to a lower portion of said rotary shaft and being adapted to be driven by water pressure produced by a water head of a dam, and a thrust bearing provided on a lower end of said rotary shaft below said water wheel for bearing a thrust load on said rotary shaft, said thrust bearing is of a hydrostatic type making use of a pressurized water as a lubricant, and water passage means for communicating said thrust bearing with said dam in such a manner that a bearing force of said thrust bearing is produced by a difference of the water head between said dam and said thrust bearing.

4,468,571

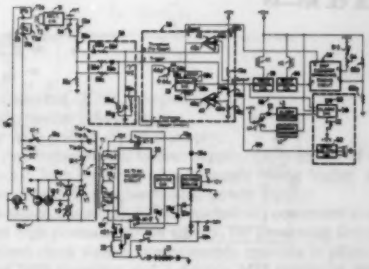
STANDBY POWER SYSTEM

Frederick D. Heavey, St. Paul, and Mark R. Kaldun, Eagan, both of Minn., assignors to SAFT America, Inc., Valdosta, Ga.

Filed Oct. 27, 1982, Ser. No. 436,990

Int. Cl.³ H02J *7/00*

U.S. Cl. 307—66 **11 Claims**



1. In a standby AC electrical power system including load device input terminals to which the power input terminals of an electrical device to be continuously powered are to be connected, power terminal means for connecting the standby power system to a source of external AC line voltage which is normally fed to said load device input terminals to energize the electrical device, DC battery connecting terminals to which a chargeable DC battery is to be connected, and a DC to AC

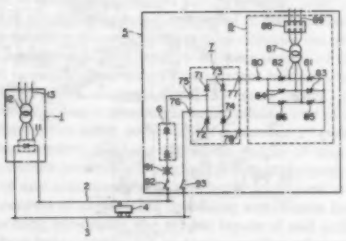
inverter circuit to be energized by said chargeable DC battery when the average value of said AC line voltage drops to a given low level when the inverter circuit is to supply a rated AC voltage to said load device input terminals, the improvement in a voltage responsive control circuit connected between said power terminal means and said DC to AC inverter circuit, said control circuit comprising: full wave rectifier circuit means connected to said power terminal means for providing a full wave rectified pulsating DC output from the AC line voltage; DC voltage responsive circuit means coupled to the output of said rectifier circuit means for continuously providing a modified pulsating DC control voltage which has an envelope which responds to and follows but at a different rate the increase and decrease in the envelope of said rectified pulsating DC output while remaining above a given triggering level when the average value of said rectified pulsating DC output for the current half cycle involved stays above a given level indicating that the average value of the current half cycle of the AC line voltage is above said given low level, and dropping to said triggering level when the average value of the current half cycle of said AC line voltage drops to said given low level, said DC voltage responsive circuit comprising a multi-branched capacitor charge and discharge circuit having a first relatively long time constant producing branch which provides a relatively slowly increasing envelope in response to the rise in the envelope of said rectified output and a relatively short time constant producing branch which provides a relatively rapidly decreasing envelope in response to the drop in the envelope of said rectified output; and control means including a trigger circuit responsive to the dropping of said envelope of said modified pulsating DC control voltage to said triggering level for effecting the connection of said DC battery connecting terminals to said DC to AC inverter circuit to energize the same and effecting the feeding of the AC voltage output thereof to said load device input terminals to adequately energize the same.

4,468,572

FEEDER VOLTAGE COMPENSATING APPARATUS FOR ELECTRIC RAILWAY

Azusa Miura, Agso; Kesao Kambara, Tokyo; Takashi Kinoshita, Kiyose; Toshio Suzuki, Takarasuka, and Yuzuru Yonehata, Itami, all of Japan, assignors to Japanese National Railways and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 15, 1982, Ser. No. 434,710
Claims priority, application Japan, Oct. 15, 1981, 56-164676
Int. Cl.³ H02J *7/34, 1/12*
U.S. Cl. 307—69 **5 Claims**



1. A feeder voltage compensating apparatus for an electric railway, comprising:

a thyristor switch circuit in which two sets of circuit paths, each consisting of first and second thyristor switches connected in series, are connected in parallel;

an accumulator which is connected to a node between said first and second thyristor switches in one of said two sets of circuit paths of said thyristor switch circuit, and which has a current capacity capable of conducting a required current to be delivered to a feeder line; and

a rectifier which is connected across terminals of said thyristor switch circuit, and which can conduct and control currents corresponding to a charging current and a discharging current of said accumulator;

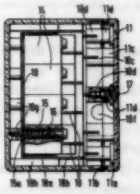
an end of said accumulator remote from the aforementioned node and also a node between said first and second thyristor switches in the other circuit path of said thyristor switch circuit being connected to power feed lines.

4,468,573

PROXIMITY SWITCH ASSEMBLY WITH MULTIPLE INTERCHANGEABLE SWITCH CORES

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,801
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114792
Int. Cl.³ H01F *15/02*
U.S. Cl. 307—113 **10 Claims**



1. An arrangement for interchangeably mounting the cores of a plurality of proximity switches in a common switch housing, the mounting arrangement comprising in combination;

a plastic injection-molded switch housing having an outwardly substantially flat sensor head wall with a row of sensor head bores, one for each proximity switch core;

a sensor head of a proximity switch core engaged in each sensor head bore;

a pair of bus bars arranged on the inner side of the sensor head wall of the switch housing, on opposite sides of the row of sensor head bores, the bus bars being connectable to a source of current for the simultaneous energization of all the proximity switch cores;

laterally protruding core shoulders on opposite sides of each proximity switch core reaching over the bus bars;

a conductive sleeve extending through each core shoulder in an orientation substantially perpendicular to the bus bar, one extremity of said sleeve engaging the bus bar; and

a fastener reaching through each conductive sleeve and pressing the conductive sleeve against the bus bar; and wherein

the proximity switch cores are centered by the engagement of their sensor heads in the sensor head bores and held in place by said fasteners; and

the proximity switch cores are insertable into and removable from the switch housing from the inner side of its sensor head wall.

4,468,574

DUAL GATE CMOS TRANSISTOR CIRCUITS HAVING REDUCED ELECTRODE CAPACITANCE

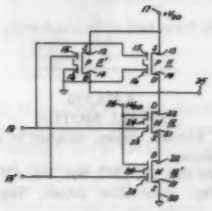
William E. Engeler, and Moshe Mazin, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 3, 1982, Ser. No. 374,586
Int. Cl.³ H03K *19/017, 19/094, 19/20*
U.S. Cl. 307—451 **2 Claims**

1. In combination:

a plurality of P-channel transistors, each including a source, a drain, a source-adjacent gate, and a drain-adjacent gate,

a plurality of N-channel transistors, each including a source, a drain, a source-adjacent gate, and a drain-adjacent gate,
a plurality of input terminals,
an output terminal,
each source of said P-channel transistors being connected to a first reference potential,
each drain of said P-channel transistors being connected to said output terminal,
each source-adjacent gate of said P-channel transistors being connected to a respective input terminal,
each drain-adjacent gate of said P-channel transistors being connected to a third reference potential sufficiently negative with respect to said first reference potential to exceed the turn-on potential thereof,



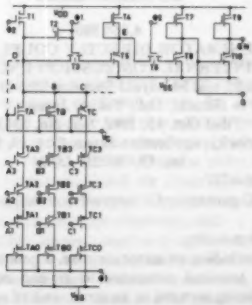
the source-to-drain conduction paths of said N-channel transistors being connected in series in the order named between a second reference potential and said output terminal, said second reference potential being negative with respect to said first reference potential,
each of the source-adjacent gates of said N-channel transistors being connected to a respective input terminal,
each of the drain-adjacent gates of said N-channel transistors being connected to a fourth reference potential sufficiently positive with respect to said second reference potential to exceed the turn-on potential thereof.

4,468,575

LOGIC CIRCUIT IN 2-PHASE MOS-TECHNOLOGY

Egon Mathes, Elmshorn, Fed. Rep. of Germany, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,876
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1980, 3047222
Int. Cl.³ H03K *19/017, 19/096*
U.S. Cl. 307—481 **7 Claims**



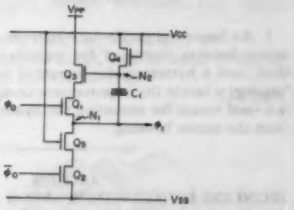
1. A logic circuit in two phase MOS technology comprising a plurality of logic elements, each of said plurality arranged to include a MOS sensing transistor and a series arrangement of MOS transistors,
first means for applying signals to be processed to said series arrangements,
second means for applying sensing clock signals to said sensing transistors,
third means for applying a reference potential to one end of each of said series arrangements,
fourth means for applying operating voltage to the opposite end of each of said series arrangement through a MOS charging transistor common to each of said series arrangements, said charging transistor receiving charging clock signals, said sensing transistor of each of said series arrangements and said charging transistor being alternatively conductive in time, said charging transistor having a main electrode connected to said series arrangements,
fifth means for applying outputs of said series arrangements to a gate of at least one MOS output transistor, said MOS output transistor supplying unambiguous low signals when the output of said logic circuit carries a voltage between said operating voltage and a fraction thereof, and
additional MOS transistors connected between each of said series arrangements and said MOS charging transistor, said additional MOS transistors having gate electrodes together receiving a signal such that each of said additional MOS transistors is cutoff for voltage values between said operating voltage and a voltage value lower than a fraction of voltage on said output at least during conductive phases of said sensing transistors.

4,468,576

INVERTER CIRCUIT HAVING TRANSISTORS OPERABLE IN A SHALLOW SATURATION REGION FOR AVOIDING FLUCTUATION OF ELECTRICAL CHARACTERISTICS

Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 25, 1982, Ser. No. 392,346
Claims priority, application Japan, Jun. 29, 1981, 56-99746
Int. Cl.³ H03K *19/096, 5/153, 17/14, 17/06*
U.S. Cl. 307—481 **6 Claims**



5. An inverter circuit, comprising:
a low-potential power supply;
a first high-potential power supply;
a second high-potential power supply, the potential of said second high-potential power supply being higher than that of said first high-potential power supply;
clock signal generating means, operatively connected to said first high-potential power supply, for generating first and second clock signals approximately opposite in phase;
a load MIS transistor and a driving MIS transistor operatively connected in series between said low-potential power supply and said second high-potential power supply, said load MIS transistor and said driving MIS transistor each having a gate for receiving a respective one of said clock signals;
a connection node, formed between said load MIS transistor and said driving MIS transistor, for outputting an output signal;
at least one first MIS transistor, operatively connected be-

tween said second high-potential power supply and said load MIS transistor, having a gate; and

means, operatively connected to said first high-potential power supply and the gate of said first MIS transistor, for raising a gate potential of said first MIS transistor to a potential level higher than that of said second high-potential power supply, said means comprising:

a second MIS transistor having a drain and a gate commonly connected to said first high-potential power supply and having a source operatively connected to the gate of said first MIS transistor; and

a capacitor having a first electrode operatively connected to the source of said second MIS transistor and to the gate of said first MIS transistor and having a second electrode operatively connected to the gate of said load MIS transistor.

4,468,577

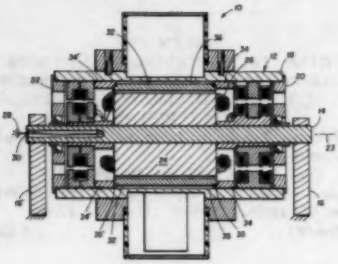
MINIMIZATION OF MOTOR SLIP AT SYNCHRONOUS SPIN FREQUENCY OF AN INSIDE-OUT HYSTERESIS SYNCHRONOUS MOTOR

Dennis M. Treu, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 19, 1983, Ser. No. 496,046

Int. Cl.³ G01C *19/08*; H02K *49/04*

U.S. Cl. 310—105 **3 Claims**



1. An improved inside-out hysteresis motor having a metal motor housing journaled for rotation about a fixed central shaft, and a hysteresis ring mounted interiorly of the motor housing, wherein the improvement comprises: austenitic stainless steel means for mounting the hysteresis ring spaced apart from the motor housing.

4,468,578

IRONLESS ROTOR WINDING FOR ELECTRIC MOTOR

Yuji Takahashi, 609-3 Horinishi, Hatano-shi, Kanagawa-ken, Japan

Division of Ser. No. 170,147, Jul. 18, 1980, , which is a division of Ser. No. 41,182, May 21, 1979, Pat. No. 4,320,319. This application Jun. 25, 1982, Ser. No. 391,989

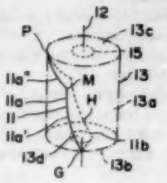
Claims priority, application Japan, May 31, 1978, 53-64375; Jun. 6, 1978, 53-67312

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ H02K *3/00*

U.S. Cl. 310—198 **2 Claims**

1. An ironless cup-shaped rotor for an electric motor comprising a cylindrical body formed from a continuous winding of consecutive closely spaced turns of self-bondable wire, each said turn including a first portion forming a first terminate face of said cylindrical body, said first portion lying generally in a plane at right angles to the axis of said cylindrical body, a second portion disposed upon the circumference and lying at a first angle to the axis of said cylindrical body, a third portion disposed along the circumferential edge of the other terminate face of said cylindrical body, and a fourth portion also disposed upon the circumference of, and at a second angle substantially equal to said first angle to the axis of said cylindrical body, each said turn held in place by a subsequent turn of said self-



bondable wire to form said cylindrical body into a rigid cup-shaped rotor.

4,468,579

SMALL MOTOR

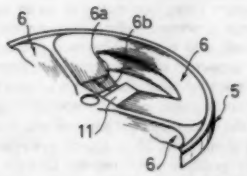
Tadashi Suzuki, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 420,093

Claims priority, application Japan, Sep. 18, 1981, 56-138695[U]

Int. Cl.³ H02K *3/04*

U.S. Cl. 310—208 **1 Claim**



1. In a small motor having a substantially disc-shaped rotor body carried by a rotor shaft and provided with a plurality of coils, a substantially doughnut-shaped stationary magnet disposed in the vicinity of one side face of said rotor body, and a commutator mounted on the portion of said rotor shaft located in the aperture of said stationary magnet: the improvement comprising that a portion of each coil adjacent to said commutator is bent so as to extend away from said stationary magnet to provide a recess receiving the end of the coil adapted to be connected to said commutator.

4,468,580

AC GENERATOR DIRECTLY COUPLED WITH INTERNAL COMBUSTION ENGINE

Susumu Sasaki, and Masayuki Shizuka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 13, 1982, Ser. No. 434,056

Claims priority, application Japan, Oct. 14, 1981, 56-162660

Int. Cl.³ H02K *13/04*

U.S. Cl. 310—237 **4 Claims**

1. An AC generator for internal combustion engines, comprising:

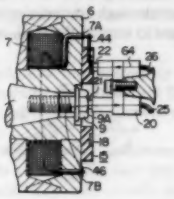
a generator casing;

a stator including an armature core, a generator coil and an output terminal connected to an end of said coil, said stator being secured to an inner wall of said casing;

a rotor fitted on a forward axial end of a crankshaft and including a hub secured by a mounting screw axially at the end of said crankshaft, claw tooth magnetic poles pressure-fitted on said hub, and a field coil arranged in a space formed by said claw tooth magnetic poles and said hub,

said mounting screw being disposed coaxially with said crankshaft and electrically connected to one end of said field coil, and said rotor being arranged inside of said stator;

a collector device including an annular conductor electrically connected to the other end of said field coil and arranged along a circumference of a predetermined radius



from a center of said rotor, said collector device being secured to the axial end of said rotor; and

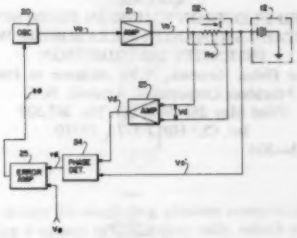
brush means including a first brush electrically connected to a head of said mounting screw, and a second brush in sliding contact with a second collector conductor, said brush means being secured to said casing, whereby a field current flows through a path including said one end of said field coil, said mounting screw and said first brush.

4,468,581

DRIVE CIRCUIT FOR A PIEZOELECTRIC RESONATOR USED IN A FLUIDIC GAS ANGULAR RATE SENSOR

Yasushi Okada, Asaka; Fumitaka Takahashi, Hoya, and Katsutoshi Tagami, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,067
Claims priority, application Japan, Jun. 25, 1981, 56-98621
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—316 **6 Claims**



1. A phase locked driving circuit for a piezoelectric pump in a gas angular rate sensor, said driving circuit comprising:

(a) voltage controlled oscillator means for providing an oscillating drive signal to said piezoelectric pump;

(b) phase difference detector means coupled to the output of said oscillator means, for detecting the phase of the current of said output signal and the phase of the voltage of said output signal and for providing an output indicative of the phase difference therebetween; and

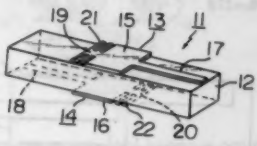
(c) error amplifier means, coupled to said phase difference detector means, for comparing said phase difference output of the phase difference detector means to a predetermined phase difference signal and for producing an error voltage indicative of the difference between the predetermined phase difference signal and the output of the phase difference detector means, said error voltage being applied to the control input of said voltage controlled oscillator means for controlling the output thereof.

4,468,582

PIEZOELECTRIC RESONATOR CHIP AND TRIMMING METHOD FOR ADJUSTING THE FREQUENCY THEREOF

Yoshiro Fujiwara, Kawasaki; Yuji Kojima, Chigasaki; Sumio Yamada, Kawasaki; Hiroshi Hoshino, Kawasaki, and Noboru Wakatsuki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 19, 1983, Ser. No. 486,532
Claims priority, application Japan, Apr. 20, 1982, 57-65946; Apr. 20, 1982, 57-65948; Apr. 28, 1982, 57-72448
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—312 **9 Claims**



1. A piezoelectric resonator chip comprising:

a piezoelectric chip plate having opposite surfaces;

a pair of electrode patterns formed on the opposite surfaces of said piezoelectric chip plate, respectively, said pair of electrode patterns facing each other through said piezoelectric chip plate, at least one of said pair of electrode patterns having a comb-shaped adjuster pattern comprising:

a narrow cutting pattern formed on one of said opposite surfaces of said piezoelectric chip plate; and

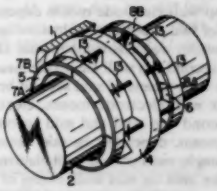
a separation pattern operatively connected to said at least one of said pair of electrode patterns through said narrow cutting pattern.

4,468,583

PIEZOELECTRIC ROTARY ACTUATOR

Kenji Mori, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 539,759
Claims priority, application Japan, Oct. 22, 1982, 57-184538
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—328 **13 Claims**



1. A rotary actuator for converting electrical energy into rotating torque comprising:

a stator;

a rotor supported by said stator so as to be rotatable relative to said stator;

a holding member provided on said stator so as to extend toward said rotor;

annular first drive means disposed on both sides of said holding member for clamping and releasing said rotor by making expansive and contractive deformations in the radial direction thereof;

second drive means disposed between and fixed to said first drive means and said holding member for causing rotary movement of said first drive means around said rotor; and

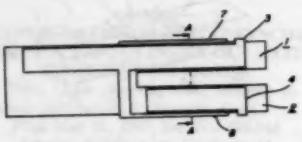
means for applying an energizing voltage to said first and second drive means.

4,468,584

UNIDIRECTIONAL FLEXURE TYPE TUNING FORK CRYSTAL VIBRATOR

Tutomu Nakamura, Akashi, and Tamotsu Koyama, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 57,988, Jul. 16, 1979, abandoned, which is a continuation of Ser. No. 838,053, Sep. 30, 1977, abandoned. This application Feb. 9, 1982, Ser. No. 347,098
Claims priority, application Japan, Oct. 1, 1976, 51-118735
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—370 **7 Claims**



1. A flexure type crystal vibrator comprising:
a crystal body including at least a first branch and a second branch;
electrode means deposited on the first and second branches of said crystal body;
driving means for applying a unidirectional electric field to the branches of said crystal body via the electrode means to create a first electric field and a second electric field in said first branch and said second branch, respectively, said electric fields being directed in substantially one direction and varying in strength along said one direction;
said first and second branches include a top wall means, bottom wall means, an inner wall means, and an outer wall means;
first top wall electrode means deposited on said top wall means of said first branch;
first bottom wall electrode means, electrically connected to said first top wall electrode means, deposited on said bottom wall means of said first branch;
second outer wall electrode means electrically connected to said first top wall electrode means and said first bottom wall electrode means, deposited on said outer wall means of said second branch;
second top wall electrode means deposited on said top wall means of said second branch;
second bottom wall electrode means, electrically connected to said second top wall electrode means, deposited on said bottom wall means of said second branch; and
first outer wall electrode means, electrically connected to said second top wall and said second bottom wall electrode means, deposited on said outer wall means of said first branch, each of said wall electrode means occupying a surface area on said wall means of the first and second branches, the surface areas being approximately equal.

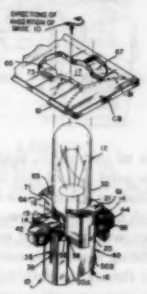
4,468,585

WEDGE BASE LAMP SOCKET

Laurens S. Beyland, Falmouth, Me., and Bernard J. Warren, Hillsboro, N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 18, 1982, Ser. No. 359,470
Int. Cl.³ H01J *5/48, 5/50*
U.S. Cl. 313—318 **10 Claims**

1. A wedge base lamp assembly comprising:
a socket constructed of an electrically insulating material and having a base adapted for being positioned within an aperture within a circuit board and including opposed side walls extending from the base and having facing inner surfaces defining therebetween a lamp-receiving aperture having an upper aperture section of greater diameter than a lower aperture section; and
an incandescent lamp having a lower press seal and a pair of lead wires extending from the seal and each of a length greater than the height to be inserted into said lamp-receiving aperture, said socket including opposed front and back walls extending from said socket base and each having a slot therethrough communicating from the lamp-receiving aperture to outside the wall, said front and back



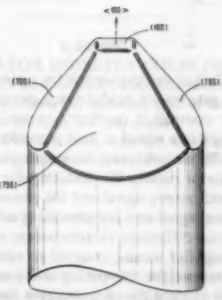
wall slots for receiving respective ones of said pair of lead wires, said front and back walls each having a flat-sided lead wire receiving support post extending from the wall and disposed adjacent the wall slot, said lead wires each extending through a respective one of said wall slots and being wrapped about a respective one of said support posts to provide a spring-like electrical connection with a respective circuit path located on said circuit board when said base of said socket is positioned within said aperture of said board.

4,468,586

SHAPED ELECTRON EMISSION FROM SINGLE CRYSTAL LANTHANUM HEXABORIDE WITH INTENSITY DISTRIBUTION

Fritz-Jürgen Hohn, Armonk, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1981, Ser. No. 267,320
Int. Cl.³ H01J *1/16, 19/10*
U.S. Cl. 313—336 **57 Claims**



1. Apparatus for producing a shaped electron beam, comprising:
a lanthanum hexaboride single crystal for emitting an electron beam along a beam axis, characterized in that said lanthanum hexaboride single crystal has a flat emitting

surface perpendicular to said beam axis, said electron beam being primarily emitted from said flat surface and from substantially the entire area of said flat surface, said flat emitting surface exposing a crystal plane having a work function equal to or less than the work function of the (111) crystal plane, said flat emitting surface having a shape corresponding with the desired shape of the emitted electron beam.

39. A method of shaping the electron beam emitted from a single crystal lanthanum hexaboride cahtode, comprising the steps of:

forming a flat surface on the emitting tip of the single crystal lanthanum hexaboride cathode, said flat surface having a shape corresponding with the desired shape of the emitted electron beam;

operating the single crystal lanthanum hexaboride single crystal cathode at conditions such that an electron beam is emitted primarily from substantially the entire area of said flat surface, said flat surface exposing a crystal plane having a work function equal to or less than the work function of the (111) crystal plane.

4,468,587

PICTURE DISPLAY DEVICE WITH QUADRUPOLE LENSES

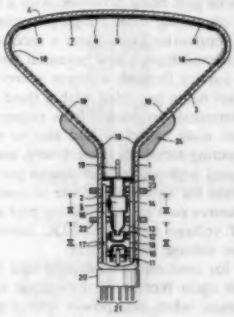
Albertus A. S. Sluyterman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,328

Claims priority, application Netherlands, Feb. 18, 1981, 8100785

Int. Cl.³ H01J *29/56, 29/64*

U.S. Cl. 313—413 **14 Claims**



1. In a device for displaying pictures comprising a display tube having a system of deflection coils, which display tube comprises an evacuated envelope having therein an electron gun for generating at least one electron beam and a display screen, which electron beam is focused on the display screen by means of a focusing lens, over which display screen the electron beam is deflected in two mutually perpendicular directions by means of the system of deflection coils, the improvement wherein the system of deflection coils is a self-converging system of deflection coils and viewed in the direction of propagation of the electron beam a first quadrupole lens is provided around the electron beam before the focusing lens and focuses the electron beam in a first direction in the centre of the focusing lens, said first direction coinciding substantially with the direction in which the focusing is substantially independent of the deflection by the system of deflection coils, and after the focusing lens a second quadrupole lens is also provided which focuses the electron beam in the first direction on the display screen so that the focusing in said first direction takes place substantially by the two quadrupole lenses and by the focusing lens in the direction at right angles thereto.

4,468,588

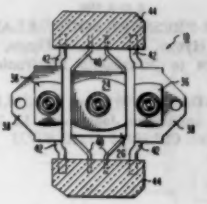
CATHODE SUPPORT STRUCTURE FOR AN IN-LINE ELECTRON GUN ASSEMBLY

Richard E. Schlack, Lititz, and Kenny S. Richard, Ephrata, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 10, 1982, Ser. No. 347,525

Int. Cl.³ H01J *29/50, 29/46*

U.S. Cl. 313—417 **6 Claims**



1. In an electron gun assembly having a control grid, a center cathode disposed between two outer cathodes, and a pair of insulating support rods for supporting said control grid and said cathodes, each of said cathodes being supported by a cathode eyelet and a beading support member, wherein each of said beading support members varies in dimensions as a function of temperature, each of said beading support members having opposed ends which are embedded in said pair of support rods, the improvement comprising means for maintaining said temperature dependent variations in dimensions of said outer beading support members substantially equal to one another and less than the temperature dependent variations in dimensions of said center beading support member thereby rigidly affixing said cathodes to said support rods, and for utilizing said temperature dependent variations in said support members to cause said support rods to apply tension to said control grid so as to restrict the temperature dependent movement of said control grid relative to said cathodes.

4,468,589

LOW SPEED ELECTRON EXCITED FLUORESCENT MATERIAL AND FLUORESCENT DISPLAY TUBE

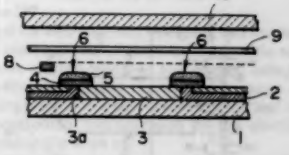
Chuichi Hikida; Tatsuo Yamaura, and Yuuzi Nomura, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Aug. 13, 1982, Ser. No. 407,948

Claims priority, application Japan, Sep. 1, 1981, 56-138202

Int. Cl.³ H01J *63/06*; C09K *11/46*

U.S. Cl. 313—496 **5 Claims**



1. A low speed electron excited fluorescent material comprising a ZnO-Zn fluorescent component excited by law speed electrons impinging thereon to emit light and at least one additive component selected from the group consisting of W, Mo, V and their oxides which is added to said fluorescent component.

3. A fluorescent display tube comprising an anode having a fluorescent material layer deposited on the upper surface

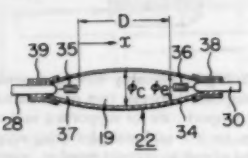
thereof and a filamentary cathode for emitting electrons which impinge on said fluorescent material layer to allow it to emit luminous light, wherein said fluorescent material layer is composed of a ZnO:Zn fluorescent component excited by low speed electrons impinging thereon to emit light and at least one additive component selected from the group consisting of W, Mo, V and their oxides which is added to said fluorescent component.

4,468,590

HIGH-PRESSURE SODIUM LAMP

Hidezoh Akutsu, Hyogo, and Yoshiro Ogata, Osaka, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Dec. 31, 1981, Ser. No. 336,172
Claims priority, application Japan, Jan. 12, 1981, 56-2806
Int. Cl.³ H01J *61/22, 61/33*
U.S. Cl. 313—573 **3 Claims**



1. A high-pressure sodium lamp comprising:

(A) an arc envelope made of alumina, fitted air-tight at both ends thereof with electrodes and associated parts thereof, and shaped so that the inner and outer diameters thereof in the vicinity of both ends thereof are reduced gradually relative to the inner diameter of the midpoint thereof; and

(B) when said arc envelope is turned on without being supported in an outer envelope, the following conditions are satisfied:

$T_e \geqq 0.85 T_c$ and 1020° C. $\geqq T_c \geqq$ 1200° C.

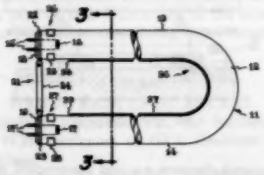
where T_e is the wall temperatures adjacent to the leading tips of the electrodes, and T_c is the wall temperature at said midpoint.

4,468,591

SHAPED DISCHARGE LAMP WITH STARTING AID AND STARTING STRIP

Edward E. Hammer, Mayfield Village, and Charles E. Beck, Chesterland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,500
Int. Cl.³ H01J *61/30, 61/54*
U.S. Cl. 313—594 **9 Claims**



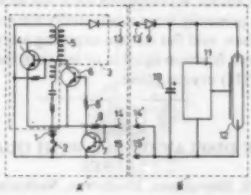
1. A discharge lamp comprising an elongated bulb shaped so that its ends are substantially closer together than if the bulb were straight and containing electrodes respectively near said ends thereof, a starting aid comprising a pair of conductive means each disposed adjacent to a respective end of said bulb and behind the plane of said electrodes with respect to the discharge path, spatially extending means electrically interconnecting said conductive means, and a conductive member comprising a stripe extending continuously along a portion of said bulb and terminating in spaced relationship to said starting aid conductive means and ahead of the plane of said electrodes with respect to the discharge path.

4,468,592

STROBO APPARATUS

Hisashi Ogura, Nara, and Kazuo Tanaka, Neyagawa, both of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Dec. 10, 1982, Ser. No. 448,440
Claims priority, application Japan, Dec. 11, 1981, 56-200466
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—241 P **3 Claims**



1. A strobo apparatus comprising:

a power source part containing a low voltage battery and a DC-DC converter circuit,

a flashing part containing main capacitor and a flash discharge tube,

said power source part being provided with a first connecting terminal connected from a high potential terminal of said DC-DC converter circuit and a second connecting terminal connected from a low potential terminal of said low voltage battery through a power source switch,

said flashing part being provided with a third and a fourth connecting terminals connected from respective two terminals of said main capacitor and also to said first and second connecting terminals respectively, and being separably connected with said power source part,

a detecting means for detecting a state of connection from said power source part to said flashing part and a state of supplying of voltage to said DC-DC converter circuit from said low voltage battery, and

control means for controlling to disable said DC-DC converter circuit upon receipt of the output signal of said detecting means, when said power source part and said flashing part are separated each other.

4,468,593

HORIZONTAL DRIVE AND NONLINEARITY CORRECTION CIRCUIT

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,585
Claims priority, application United Kingdom, Apr. 23, 1982, 8211830
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—371 **9 Claims**

1. A horizontal deflection current nonlinearity correction circuit comprising:

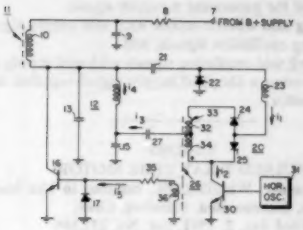
a horizontal deflection winding;

a horizontal output circuit incorporating a source of horizontal retrace pulses for providing horizontal deflection current to said deflection winding;

an inductance coupled to said horizontal deflection winding and said horizontal output circuit; and

switch means responsive to horizontal rate switching signals for defining first and second intervals, said switch means

causing said retrace pulses to be applied to said inductance for storing energy in said inductance during one of said first and second intervals and causing said stored energy



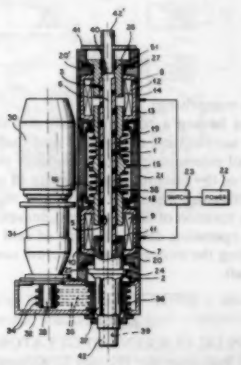
to be applied to said deflection winding during the other of said first and second intervals for providing nonlinearity correction to said deflection current.

4,468,594

ELECTROMAGNETIC PERCUSSION IMPLEMENT

Georges Jacquemet, Caluire, France, assignor to Martelec Société Civile Particulière, Caluire, France

Filed Sep. 24, 1982, Ser. No. 423,082
Claims priority, application France, Oct. 2, 1981, 81 19118
Int. Cl.³ H02P *33/00*
U.S. Cl. 318—130 **11 Claims**



1. A percussion implement comprising:

a housing;

two coaxial electromagnetic coils fixed in said housing in spaced relationship relative to each other;

a ram reciprocable between said coils coaxially therewith, said ram constituting movable armatures for said coils;

restoring means normally suspending said ram in an intermediate position between said coils;

two anvils mounted in said housing at opposite sides of said ram in striking cooperation therewith, said anvils being interlinked for associated motion under percussions caused by said ram;

bumpers fixed in said housing to limit axial displacements of said anvils in opposite directions; and

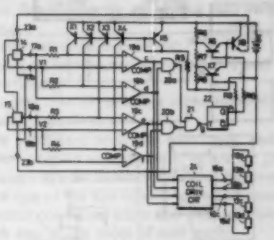
controlled electric supply means selectively energizing said coils to displace said ram unidirectionally against the force of said restoring means, whereby, depending on the energization of one or another of said coils, one of said anvils is subjected to percussions in a respective axial direction.

4,468,595

DRIVING CIRCUIT FOR A HALL MOTOR

Toshio Yaeboshi, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Dec. 17, 1982, Ser. No. 450,773
Claims priority, application Japan, Dec. 28, 1981, 56-210391
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—254 **4 Claims**



1. A driving circuit for a Hall motor which comprises a Hall element, a rotor having magnetic poles for subjecting said Hall element to a magnetic field, and coils for rotating said rotor, said driving circuit comprising:

a threshold voltage applying circuit for applying a predetermined threshold voltage;

a comparing circuit for comparing an output voltage of said Hall element which varies according to the rotation of said rotor with said threshold voltage;

a voltage applying circuit for periodically applying a high input voltage of a pulse-form to said Hall element, for a duration according to an output of said comparing circuit; and

a coil driving circuit supplied with the output of said comparing circuit, for producing an activating current to said coils, said duration in which the high input voltage of the pulse-form is applied to said Hall element corresponding to a duration in which a specific position of any one of the magnetic poles opposes said Hall element.

4,468,596

METHOD AND APPARATUS FOR THE ELECTRONIC OPERATION AND MONITORING OF THE OPENING CYCLE OR CLOSING CYCLE OF ELECTRICALLY OPERABLE UNITS

Marwin Kinzl, Kierspe, and Eduard Bergmann, Luedenscheid, both of Fed. Rep. of Germany, assignors to Leopold Kostal GmbH & Co. KG, Luedenscheid, Fed. Rep. of Germany

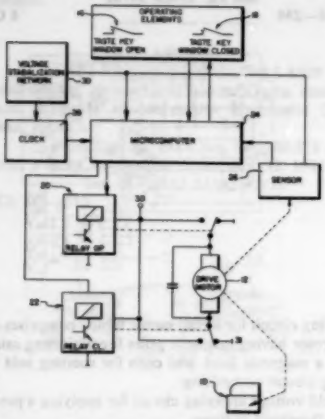
Filed Sep. 10, 1981, Ser. No. 301,026
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034118
Int. Cl.³ H02P *7/20*
U.S. Cl. 318—287 **4 Claims**

1. A method for electronically operating and monitoring the opening and closing cycle of electrically operable units, such as, for example, electric windows and electric siding roofs of automotive vehicles including electric motor means for opening and closing the electrically operable units and computer means for controlling the operation of the electric motor means comprising the steps of:

(a) coupling to the computer means signals representing the position of the unit at fixed positions during the opening cycle of the unit;

(b) coupling to the computer means signals representing the position of the unit at fixed positions during the closing cycle of the unit and subtracting those signals from the signals representing the position of the unit during the opening cycle, the difference in said signals indicating whether the unit is in a first, a second or a third zone, said first zone being in a range extending from open to approxi-

mately half open, said second zone being in a range extending from approximately half open to almost fully closed and said third zone being in a range extending from almost fully closed to fully closed, said second zone providing a safety zone,



(c) determining the time interval between any two consecutive signals coupled to the computer means, and

(d) turning off the electric motor means if the time interval between any two consecutive signals exceeds a pre-established standard value and the unit is in the first or third zones.

4,468,597

METHOD FOR REGULATING THE POWER SUPPLY TO A DIRECT-CURRENT MOTOR AND A DEVICE FOR THE APPLICATION OF SAID METHOD

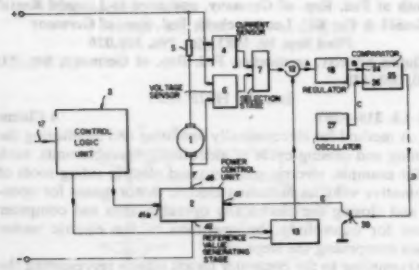
René Baumard, Azay sur Cher; André Erckelboudt, Montlouis sur Loire; Bernard Moulin, Montlouis sur Loire, and Rémi Robin, Montlouis sur Loire, all of France, assignors to Faiveley S.A., Saint-Ouen-Cedex, France

Filed Jan. 22, 1982, Ser. No. 342,192

Claims priority, application France, Feb. 11, 1981, 81 02639

Int. Cl.³ G05B *5/00*

U.S. Cl. 318—317 **3 Claims**



1. A method for regulating the current intensity and voltage applied to a direct-current electric motor with respect to a predetermined reference value by modifying the power supply to the motor, comprising the following steps:

(a) separately converting into converted quantities the voltage at the terminals of said electric motor and the current intensity within said electric motor in accordance with the same scale of a representative quantity;

(b) comparing said converted quantities with each other and retaining the larger one;

(c) comparing the retained quantity with a reference value and producing a difference signal,

(d) controlling a supply regulator by means of said difference signal for generating a supply signal,

(e) supplying said electric motor with said supply signal,

(f) generating oscillation signals, and

(g) comparing said oscillation signals with said supply signal and generating a chopped supply signal supplied to said electric motor.

4,468,598

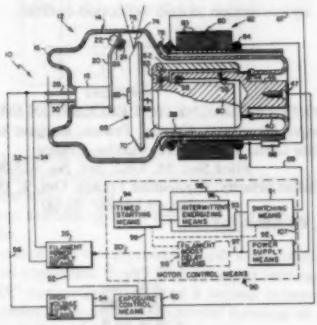
PULSED X-RAY TUBE MOTOR

Howard G. Wagner, Wheeling, Ill., assignor to The Machlett Laboratories, Incorporated, Stamford, Conn.

Filed Jan. 2, 1981, Ser. No. 222,186

Int. Cl.³ H02P *7/36*

U.S. Cl. 318—341 **6 Claims**



1. A system comprising:

motor means having a rotatable shaft and electrically disposed for accelerating rotation of said shaft; and

motor control means coupled to said motor means for, independently of the instantaneous velocity of said shaft, electrically activating the motor means at a regular period to accelerate rotation of said shaft and, independently of the electrical operating characteristics of said motor means, de-activating the motor means to permit coasting rotation of said shaft.

4,468,599

PLUG CURRENT REGULATOR

Max Berman, Charlottesville; William G. Klimmek, Earlysville, and Charles E. Konrad, Roanoke, all of Va., assignors to General Electric Company, Charlottesville, Va.

Continuation of Ser. No. 333,928, Dec. 23, 1981, abandoned. This application Jan. 25, 1984, Ser. No. 573,042

Int. Cl.³ H02P *3/12*

U.S. Cl. 318—362 **4 Claims**

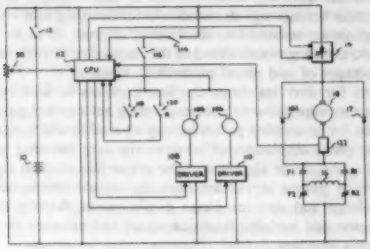
1. A method for controlling an electric traction motor propelled vehicle in a plug braking mode of operation, the vehicle including a time-ratio power regulator which is controlled to be conducting and non-conducting for connecting and disconnecting the motor to a direct-current power source, an accelerator for establishing a desired value of braking current, sensing means for providing a signal representative of actual motor current, and control means responsive to a comparison of desired braking current to actual motor current for varying the time ratio of the regulator in a manner to minimize any difference therebetween, comprising the steps of:

(a) sensing that the plug braking mode of operation is commanded;

(b) establishing a fixed conducting time interval for the regulator;

(c) establishing a minimum non-conducting time interval for the regulator; and

(d) controlling the regulator so that it is alternately conductive for said fixed time interval and non-conductive for at



least said non-conducting time interval, said minimum non-conducting time interval being sustained notwithstanding any instantaneous differences between the actual and desired braking currents during said time.

4,468,600

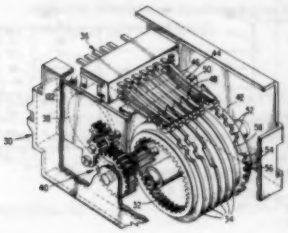
APPLIANCE CONTROLLER

Richard C. Barthel, Chicago, Ill., and Richard D. Roy, Valparaiso, Ind., assignors to The Singer Company, Stamford, Conn.

Filed Mar. 23, 1983, Ser. No. 478,137

Int. Cl.³ G05B *19/06*

U.S. Cl. 318—452 **9 Claims**



1. A controller for an appliance having a plurality of selectively energizeable electromechanical components, comprising:

input means for operator selection of a desired cycle of operation of said appliance;

a motor;

switching means coupled to be driven by said motor and having a plurality of timing cams on a rotating member for controlling the operation of a plurality of switches for applying power to energize said components; and

sequencing means for selectively advancing said switching means including:

means for applying a power to said motor;

means for detecting an incremental movement of said rotating member;

means for operating said power applying means for a defined number of incremental movements of said rotating member;

means for timing a predetermined interval commencing with the actuation of said power applying means; and

means for stopping the operation of said power applying means in the event an incremental movement of said rotating member is not detected during said predetermined interval.

9. A controller for an appliance having a plurality of selectively energizeable electromechanical components, comprising:

input means for operator selection of a desired cycle of operation of said appliance;

a motor;

switching means coupled to be driven by said motor and having a plurality of timing cams on a rotating member for controlling the operation of a plurality of switches for applying power to energize said components; and

sequencing means for selectively advancing said switching means including:

means for applying power to said motor;

means for detecting an incremental movement of said rotating member including:

a cam track on said rotating member including a plurality of spaced teeth;

a cam follower associated with said cam track; and

switching means coupled to said cam follower for providing a first circuit condition when said cam follower is in contact with one of the tips of said teeth and providing a second circuit condition when said cam follower is in contact with one of the roots of said teeth;

means for operating said power applying means for a defined number of incremental movements of said rotating member; and

means for defining a home position of said rotating member.

4,468,601

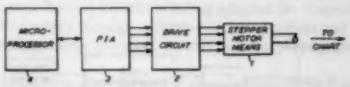
STEPPER MOTOR CONTROL

Mort Chamran, Elmhurst, and Alan Ferber, Chicago, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 2, 1982, Ser. No. 394,552

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—696 **6 Claims**



1. An improved stepper motor drive system comprising, in combination:

a permanent magnet stepper motor,

a microprocessor controlled switching circuit means for supplying drive pulses to said motor,

a power supply for providing excitation current to said switching circuit means,

control means operative through said microprocessor controlled switching circuit means comprising means for inputting a preselected count to counter means corresponding to a desired number of drive pulses to said motor, means for decrementing said counter means by one count after each pulse is applied to said stepping motor until a zero count is reached, and means for terminating said excitation current after a predetermined time delay subsequent to reaching the zero count.

4,468,602

METHOD FOR REDUCING THE CONSUMPTION OF A STEPPING MOTOR AND DEVICE FOR PERFORMING THE METHOD

Luciano Antognini, Champaign, Ill., and Hans-Jürgen Rémus, Neuchatel, Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Sep. 29, 1982, Ser. No. 426,361

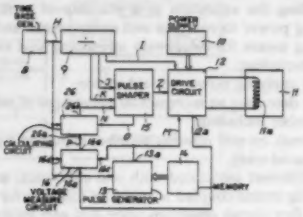
Claims priority, application Switzerland, Oct. 2, 1981, 6340/81

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—696 **14 Claims**

1. A method for reducing the consumption of a stepping motor comprising a winding having a resistance of value R and

an inductance of value L, and a rotor which is magnetically coupled to said winding, comprising triggering a drive pulse each time that the rotor is to turn through one step, detecting the mechanical load driven by the rotor during its rotary movement, controlling the duration of the drive pulse in de-



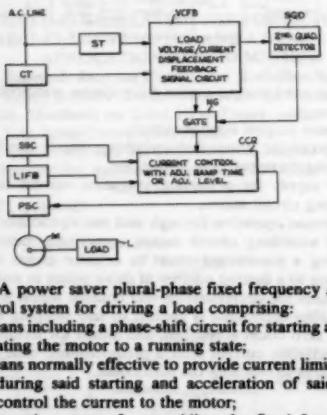
pendence on said mechanical load, forming said drive pulse by a series of elementary pulses separated by interruption periods of a duration T1, and determining said mechanical load by measuring, during said interruption periods, a parameter which is representative of the variation in the voltage induced in the winding by the rotary movement of the rotor.

4,468,603

LOAD VOLTAGE-CURRENT DISPLACEMENT REGULATOR MOTOR CONTROL SYSTEM

James C. Vander Meer, Brookfield, and Robert W. Spink, Wauwatosa, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 3, 1981, Ser. No. 250,984
Int. Cl.³ H02P *5/40, 1/26, 1/28*
U.S. Cl. 318—779 **18 Claims**



1. A power saver plural-phase fixed frequency A.C. motor control system for driving a load comprising:

means including a phase-shift circuit for starting and accelerating the motor to a running state;

means normally effective to provide current limit regulation during said starting and acceleration of said motor to control the current to the motor;

alternative means for providing the fixed frequency load voltage-current displacement regulation as sensed from the line side, regardless of the waveforms of said voltage and current, in a symmetrically balanced manner with respect to all of the motor phases to reduce the input power to the motor whenever the motor is operating at less than full load especially when unloaded or lightly loaded;

means for sensing a predetermined motor operating condition as the motor approaches full speed;

means responsive to said sensing means for substituting said load voltage-current displacement regulation means for said current limit regulation means to operate said control system in a power saver mode;

said means for providing load voltage-current displacement regulation comprising:

means for generating pulses having a width proportional to the motor voltage and current phase displacement thereby to provide a variable feedback signal comprising:

means for deriving from the line-to-line voltages of said system voltage signals and means for delaying said voltage signals an amount less than thirty degrees so as to have zero crossing points ahead of the respective line-to-neutral voltages of said plural-phase A.C. system;

means for deriving from the line currents of said system current signals having corresponding zero crossing points;

means for generating pulses having a variable width equal to the phase displacement between the zero crossing points of said voltage signals and the respective current signals which pulses are wider than the actual line-to-neutral voltage and current phase displacement thereby to increase said variable feedback signal and enhance the system's response to load changes;

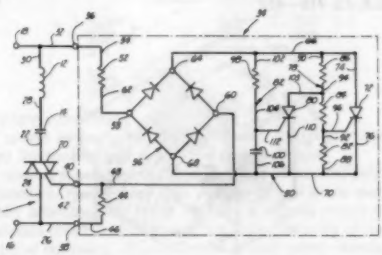
and means responsive to said variable feedback signal for controlling said phase-shift circuit to adjust the power input to the motor to an optimum value thereby to avoid overpowering the load and consequent waste of energy.

4,468,604

MOTOR STARTING CIRCUIT

Andrew Zaderej, 4016 N. Home St., Mishawaka, Ind. 46545

Continuation-in-part of Ser. No. 179,678, Aug. 20, 1980, abandoned. This application Mar. 4, 1982, Ser. No. 354,539
Int. Cl.³ H02P *1/42*
U.S. Cl. 318—786 **15 Claims**



1. A motor starting circuit for momentarily energizing the starting winding circuit of a single-phase, alternating current motor, comprising:

a triac connected, via the main terminals thereof, in series with said starting winding circuit; and

a switching circuit having first and second input terminals and a gate terminal, wherein the switching circuit is connected, via the input terminals thereof, in parallel with the serially connected triac and starting winding circuit, the second input terminal of the switching circuit being connected to a main terminal of the triac with the opposite main terminal thereof connected to the starting winding circuit, wherein the gate terminal of the switching circuit is connected to the gate of the triac, and wherein the switching circuit comprises:

a biasing resistor connected between the gate terminal and the second input terminal of the switching circuit, and

timing means, connected between the first input terminal of the switching circuit and the gate terminal thereof for establishing a relatively low effective resistance between the first input terminal and the triac gate for a preselected time period following connection of the motor to an electrical source and thereafter establishing a relatively high effective resistance between the first input terminal and the triac gate, said timing means including:

a load resistor having one end thereof connected to the first input terminal of the switching circuit;

a full-wave recifier bridge having the input terminals thereof connected between the other end of the load resistor and the gate terminal of the switching circuit;

a first SCR connected in parallel across the output terminals of the rectifier bridge so as to substantially provide a short circuit between the load resistor and the gate terminal of the switching circuit at such time that the first SCR is in a conducting state;

a first SCR gating branch, comprising:

a first gating branch resistor connected between the cathode and gate of said first SCR;

a second gating branch resistor having one end thereof connected to the junction of the first gating branch resistor and a gate of said first SCR; and

a third gating branch resistor connected between the other end of the second gating branch resistor and the anode of said first SCR, wherein the third gating branch resistor has a resistance which is large in relation to the resistance of the load resistor;

a timing branch, comprising:

a timing resistor having one end thereof connected to the anode of said first SCR; and

a timing capacitor connected between the other end of the timing resistor and the cathode of said SCR for charging through the timing resistor; and

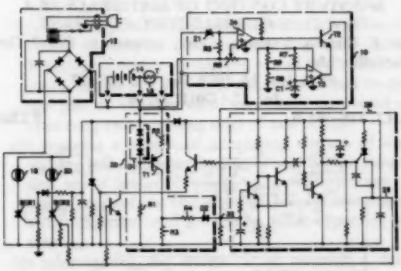
turn-off means, connected between the junction of the timing resistor and timing capacitor, the junction of the second and third gating branch resistors, and the junction of the first gating branch resistor and the first SCR cathode, for substantially providing a short circuit across the first and second gating branch resistors in response to charging of the timing capacitor to a preselected level.

4,468,605

TIMED VOLTAGE CLAMP FOR BATTERY CHARGER

Edward A. Fitzgerald, Ft. Lauderdale, and Darrell A. Pfeffer, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 12, 1982, Ser. No. 367,327
Int. Cl.³ H02J 7/04
U.S. Cl. 320—36 **7 Claims**



1. A charging circuit for use with a battery having an associated temperature sensing device, the circuit comprising:

power supply means for supplying DC power to the battery;

switching means for controlling the level of power supplied by the power supply means to the battery in response to a control signal;

a first control circuit coupled to supply a first control signal to the switching means in response to a predetermined battery temperature sensed by the sensing device;

a second control circuit coupled to supply a second control signal to the switching means in response to a predetermined battery voltage; and

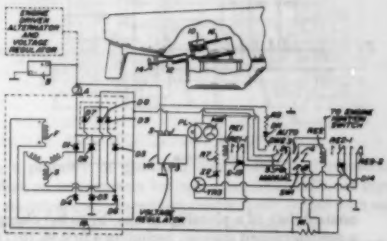
timing means for enabling the second control circuit for a predetermined time period, said period beginning at the start of each charge cycle.

4,468,606

SYSTEM FOR CHARGING THE BATTERY AND OPERATING THE ELECTRICAL ACCESSORIES OF A SAIL-BOAT

Yvan Quintal, 12,663 Fortin St., Montreal-North, Canada H1G 4A3

Filed May 7, 1982, Ser. No. 375,885
Int. Cl.³ H02J 7/00
U.S. Cl. 320—61 **9 Claims**



1. In combination with a sail-boat having an auxiliary engine driving a propeller of the fixed blade type secured to an auxiliary propeller shaft and for use when the wind is too low to propel the boat, a system for charging the battery and operating the electrical accessories of said sail-boat, comprising:

(a) an alternator having a stator winding adapted for connection to the battery through suitable current rectifiers and a rotor field winding coupled to said auxiliary propeller shaft;

(b) circuit means for controlling the energization of the field winding of the alternator from the output voltage of the stator winding, so as to permit the alternator to provide adequate current to charge the battery and operate the electrical accessories of the sail-boat; and

(c) a voltage regulator adapted for connection to the field winding of the alternator for controlling the output voltage of the stator winding when such output voltage reaches a predetermined value, and

(d) said circuit means including an optimizing resistor connected in said rotor field winding for adjusting the optimum output current of the stator winding for a predetermined boat speed, so as to reduce to a minimum the drag of the alternator on the boat.

4,468,607

LADDER-TYPE SIGNAL ATTENUATOR

Kouji Tanaka, and Susumu Yamada, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd. and Tokyo Sanyo Electric Co., Ltd., both of, Japan

Filed May 4, 1982, Ser. No. 374,886
Claims priority, application Japan, May 7, 1981, 56-69180; May 7, 1981, 56-69181; Jun. 3, 1981, 56-85991
Int. Cl.³ H03H 7/26; H03K 13/02
U.S. Cl. 323—354 **17 Claims**

1. A ladder-type signal attenuator, comprising:

A ladder network (50) including an R-2R-type resistor ladder circuit of a plurality of stages (n-1) each having an input resistor (2R) and an output resistor (R), and a ladder portion of the final stage (n) having an input resistor (8) and an output resistor (7) and coupled in a cascade fashion to said R-2R-type resistor ladder circuit,

at least one of said input resistor (8) and said output resistor

(7) of said final stage ladder portion being selected to have a resistance value (RB, RA) which is different from the resistance value (2R, R) of the corresponding one of the input resistor and the output resistor of the preceding stage,

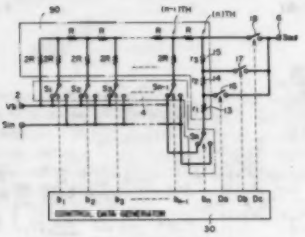
each stage (1 to n) of said ladder network (50) having a signal input terminal,

a signal output terminal (6) for withdrawing an output signal (Sout) from said ladder network (50),

means (2) for providing a predetermined potential (Vb) to said ladder network (50),

means (1) for providing an input signal (Sin) to said ladder network (50),

first control data providing means (3, 30) for providing first



control data of a plurality of bits (b_1 to b_n) changeable in a predetermined manner, including a first bit (b_1) to a final bit b(n) each corresponding to one said stages (1 to n) respectively, and each of said bits having first and second states,

input switch means (S_1 to S_n) responsive to the states of each bit (b_1 to b_n) of said first control data for selectively providing a corresponding signal input terminal with said pre-determined potential (Vb) or said input signal (Sin), and

first resistance value changing means (9:10:11:12) responsive to the states of the final bit (b_n) of said first control data for changing the resistance value (RA, RB) of at least one of said input resistor (8) and said output resistor (7) of said final stage ladder portion.

4,468,608

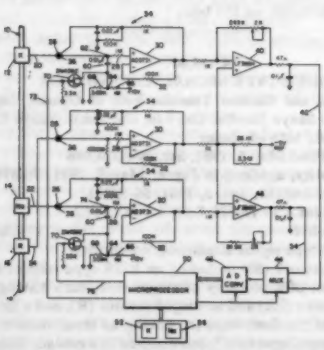
ELECTROCHEMICAL SENSOR INSTRUMENTATION

Norman F. Rolfe, Carlisle, Mass., assignor to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Dec. 11, 1981, Ser. No. 329,747

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—51 **6 Claims**



5. Circuitry for monitoring a high impedance ion selective electrode that provides an output signal over an output signal line comprising a capacitor coupled to said output signal line of said ion selective electrode, the shunt impedance of said capacitor being at least one hundred gigaohms, means to apply a step voltage to said capacitor, and means to monitor the change in voltage on said output signal line resulting from the application of said step voltage to said capacitor to provide an indication of the quality of said ion selective electrode.

4,468,609

CONTROL SYSTEM FOR THE DETECTION OF LEAKS IN INSULATED PIPES

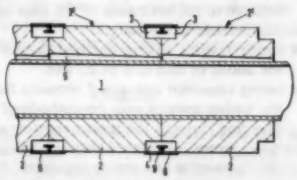
Friedhelm Schmitz, 4, Schillerweg, 5883 Kierspe, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,403

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045257

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 QS **12 Claims**



1. A control system for the detection of leaks in insulation-jacketed pipes having measuring probes, each with two electrodes, arranged at sectional intervals and connected to an evaluation circuit, characterized by the following features:

(a) the heat insulating jacket (2') has radially open measuring chambers (4);

(b) measuring probes are removably insertable into the measuring chambers (4);

(c) each measuring probe has connection (means 61, 11, 12, 47) for the evaluation circuit; and

(d) the electrodes serve as a frequency-determining element in an oscillator.

4,468,610

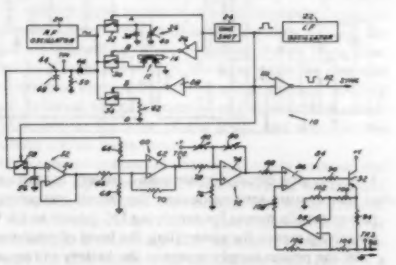
RADIO FREQUENCY APPARATUS FOR MEASURING MOISTURE CONTENT OF MATERIALS AS A FUNCTION OF DIELECTRIC CONSTANT

Colin J. Hanson, Valencia, Calif., assignor to Penril Corp., Rockville, Md.

Filed Apr. 14, 1982, Ser. No. 368,427

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 R **8 Claims**



8. Apparatus for measuring a physical characteristic of materials as a function of dielectric characteristics of said material comprising first means including an rf source and an antenna for obtaining a first signal B as a function of dielectric charac-

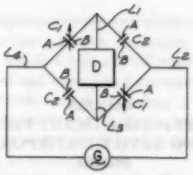
teristics of said material, second means coupled to said rf source for obtaining second and third signals A and D both independent of said dielectric characteristics of said material, said signals A and D being unequal, and means for determining said physical characteristic of said material as a function of a ratio of a difference between signals B and D to a difference between signals A and D.

4,468,611

CAPACITIVE SYSTEM FOR MONITORING THE DIELECTRIC PROPERTIES OF FLOWING FLUID STREAMS

Emanuel Tward, Northridge, Calif., assignor to Tward 2001 Limited, Los Angeles, Calif.

Filed Jun. 1, 1982, Ser. No. 383,792
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 R **19 Claims**



1. A method for comparing the dielectric properties of a flowing stream of fluid with the dielectric properties of a reference fluid which comprises:

(a) providing a multi-capacitor flowing fluid sensor formed of a first pair of capacitors having like dielectric spaces within which a reference fluid is maintained under non-flow conditions as the dielectric material filling said spaces and a second pair of capacitors having like dielectric spaces within which a sample portion of the flowing stream of fluid is continuously passed as the dielectric material filling said spaces, said first pair of capacitors having substantially fixed and like capacitive value and said second pair of capacitors having variable capacitive value related to the variable dielectric constant value of said sample portion;

(b) connecting the first and second pairs of capacitors of said sensor together to form the four capacitive sides of a Wheatstone bridge circuit, the pair of fixed value capacitors connected as two opposing sides of said bridge and the pair of variable value capacitors connected as the remaining two opposing sides of said bridge;

(c) applying a source of alternating current of constant voltage and set frequency across said bridge circuit to a first set of bridge terminals at opposite corners of the bridge, each of said first terminals located between a fixed value capacitor and a variable value capacitor of said sensor;

(d) interrogating the bridge circuit through a detection circuit connected across said bridge to a second set of bridge terminals independent of said first set of terminals and at opposite corners of the bridge, each of said second terminals located between a fixed value capacitor and a variable value capacitor of said sensor; and

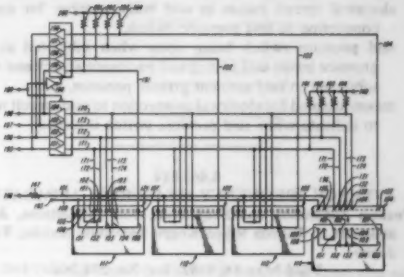
(e) measuring the current value in said detection circuit and indicating said value as a deviation value of dielectric constant of the sample portion of the flowing stream of fluid with respect to the dielectric constant of the reference fluid in direct linear relationship with said current value.

4,468,612

ARRANGEMENT FOR INDICATING WHEN DIFFERENT TYPES OF ELECTRICAL COMPONENTS ARE INTERCONNECTED

Thomas J. J. Starr, Wheaton, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 15, 1982, Ser. No. 339,380
Int. Cl.³ G01R *19/00, 31/02*
U.S. Cl. 324—66 **11 Claims**



1. In a plurality of electrical components and connector assemblies, an arrangement for indicating when different types of said electrical components are concurrently joined with said connector assemblies; said arrangement comprising:

a plurality of output conductors common to said connector assemblies, and

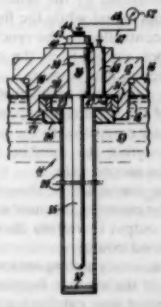
a plurality of identification conductors on each of said components, each plurality of identification conductors adapted for applying a distinct pattern of potentials on said output conductors when one of said components is joined with one of said connector assemblies to identify the type of the joined component and, when different types of said components are concurrently joined with said connector assemblies, all of said output conductors and the identification conductors on the joined ones of said components being interconnected for applying to said output conductors a first predetermined pattern of potentials other than said distinct patterns.

4,468,613

APPARATUS FOR DETECTING CORROSION RATE

Carlton M. Slough, Spring, and Stephen A. Cruser, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,536
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—71.2 **7 Claims**



1. Probe for detecting corrosion rate of metallic piping,

tanks and the like subjected to a corrosive gaseous ambience, comprising

a body member having means for mounting on said piping,

a thin cylindrical metal enclosure mounted on said body member and adapted for extending into said piping,

said gaseous ambience being inside said piping and having a pressure greater than the pressure inside said cylindrical enclosure,

a pressure switch supported by said body member and subjected to said pressure inside said cylindrical enclosure,

electrical circuit means in said body member for making connection to said pressure switch,

said pressure switch being open when subjected to said pressure inside said cylindrical enclosure and closed when subjected to said ambient greater pressure, and

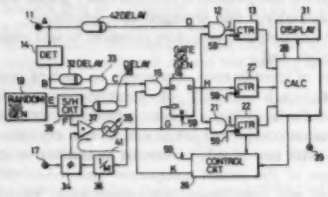
means adapted for electrical connection to said circuit means to indicate when said pressure switch is closed.

4,468,614

AVERAGE FREQUENCY MEASURING APPARATUS

Toshiro Takahashi, and Shoji Niki, both of Saitama, Japan, assignors to Takeda Riken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,268
Claims priority, application Japan, May 22, 1981, 56-77848
Int. Cl.³ G01R *23/10*
U.S. Cl. 324—78 D **24 Claims**



1. An apparatus for measuring the average frequency of an input signal with a predetermined desired accuracy R, said apparatus comprising:

clock generating means for generating a clock signal having a period t_0;

auxiliary gate signal generating means for generating auxiliary gate signals in response to an input thereto, for roughly determining the times for said measuring of said average frequency;

a gate signal generator for converting the auxiliary gate signals from the auxiliary gate generating means into synchronized gate signals synchronized in a predetermined manner with a predetermined one of said clock signal and said input signal;

a first gate controlled by the synchronized gate signals to pass said input signal while the first gate is open;

a second gate controlled by the synchronized gate signals to pass the clock signals from the clock generating means while the second gate is open;

a first counter connected to the first gate, for counting the number F of the input signals passed by the first gate;

a second counter connected to the output side of the second gate, for counting the number T of the clock signals passed by the second gate;

a third counter connected to the output of the gate signal generator, for counting the number N of the synchronized gate signals output therefrom during the counting of said first and second counters;

measurement accuracy setting means for setting said desired accuracy R of the average frequency measuring;

minimum counting time calculating means connected to the second and third counters and to the measurement accuracy setting means, for calculating a minimum counting time corresponding to said accuracy R and the numbers T and N;

counting end detecting means for detecting that the time for which the first, second and third counters perform their counting operation exceeds the minimum counting time calculated by the minimum counting time calculating means and for providing a respective output;

control means for stopping the generation of the synchronized gate signals from the gate signal generator according to said output from the counting end detecting means; and

frequency calculating means connected to said first and second counters for calculating the average frequency of the input signals with at least said desired accuracy, as

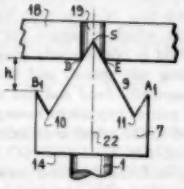
$$\frac{F}{T \times t_0}$$

4,468,615

PROBE FOR A PRINTED-CIRCUIT TESTING DEVICE, AND A TESTING DEVICE INCORPORATING SAID PROBE

Michel Jamet; Jean Claude Urien, and Gérard Bureau, all of Buc, France, assignors to Societe d'Etudes Techniques et d'Enterprises Generales Transmission Automatique & Informatique - Sodeteg Tai, Buc, France

Filed Mar. 25, 1981, Ser. No. 247,338
Claims priority, application France, Mar. 26, 1980, 80 06691
Int. Cl.³ G01R *1/06, 31/02*
U.S. Cl. 324—158 P **4 Claims**



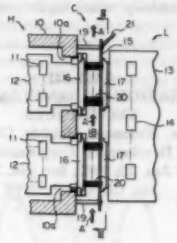
1. A probe for a printed-circuit testing device which operates on the principle of initiation of electrical contacts comprising, a rod, a tubular body and a head at an end of the rod, said rod being slidably mounted in said tubular body, said head constituting a conductive cylindrical segment provided at the free end of said rod, said cylindrical segment being formed with a central pyramidal portion having triangular faces, an apex, and a triangular base, said triangular base defined by the bottoms of grooves cut in the cylindrical segment which terminates at the lower edges of the triangular faces of said pyramidal portion, said grooves defining a crown portion having three projecting portions on said segment each projecting portion terminating in a sharp edge, said projecting portion being of a height from the base of said segment of approximately one-half of the height of said pyramidal portion from the base of said segment as to enable said apex to be in contact with a metallized hole in said printed circuit without any contact of said crown portion with a component borne by said printed circuit, thereby permitting the use of a single probe for testing both a base printed circuit and a printed circuit equipped with components.

4,468,616

TESTING EQUIPMENT FOR ELECTRIC COMPONENTS

Tsutomu Yoshizaki, Yokosuka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 26, 1981, Ser. No. 296,312
Int. Cl.³ G01R 31/00
U.S. Cl. 324—158 F 3 Claims



1. Testing equipment for electric components, comprising:

a high-temperature section including a homoiothermic chamber in which a plurality of components to be tested are contained and heated to a constant high temperature;

a low-temperature section including a driving circuit for generating signals to operate the components to be tested, and electric power sources for the driving circuit and the components to be tested; and

connecting means for electrically connecting said high-temperature and low-temperature sections;

said high-temperature section comprising a first printed board positioned in the homoiothermic chamber, on which the components to be tested are mounted,

said low-temperature section comprising a second printed board on which said driving circuit is mounted, and

said connecting means comprising a connecting unit including:

a third printed board, having first and second surfaces, disposed outside the homoiothermic chamber, the first surface of the third printed board positioned facing a wall of the homoiothermic chamber so as to define a space therebetween;

a first connector jack connected to the first surface of the third printed board by electrical conductor pins and secured to the wall of the homoiothermic chamber; and

a second connector jack mounted on the second surface of the third printed board, said first and second printed boards being removably connected to the first and second connector jacks, respectively, and the electric power sources being connected to the third printed board.

4,468,617

VELOCITY SENSOR AND METHOD OF PRODUCING A VELOCITY SIGNAL

Carl G. Ringwall, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,850
Int. Cl.³ G01P 3/52, 13/00
U.S. Cl. 324—165 15 Claims

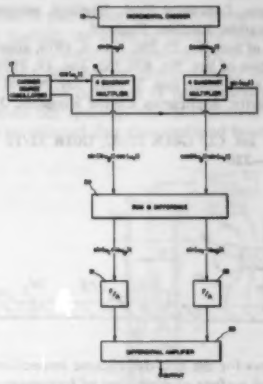
1. A velocity sensor comprising:

an optical position encoder having output signals whose frequency and phase relation depend on the rate and direction of movement of an object to which the encoder is adapted to be attached;

a source of a high frequency carrier;

means for modulating said carrier with said encoder output signals; and

means for producing two side band frequencies that are the sum and difference of said carrier and encoder output frequencies, and for deriving therefrom a positive or negative velocity signal that is continous through zero rate and whose polarity designates the direction of movement.

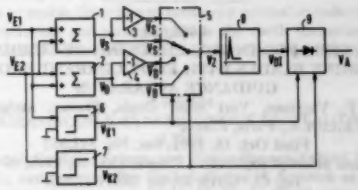


4,468,618

SYSTEM FOR GENERATING A SPEED-PROPORTIONAL VOLTAGE

Hans-Hermann Zander, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 28, 1982, Ser. No. 437,489
Int. Cl.³ G01P 13/00
U.S. Cl. 324—165 4 Claims



1. A method for generating a speed-proportional signal from first and second sinusoidal transmitter voltages which are produced by an incremental position generator and shifted 90° with respect to each other in directions which correspond to the direction of rotation of the incremental position generator, the first and second sinusoidal transmitter voltages having respective amplitudes which are independent of the speed of rotation,

from which is produced a sum signal responsive to the sum of the first and second sinusoidal transmitter voltages, the sum signal having a plurality of sequential zero crossings

and a difference signal responsive to the difference between the first and second sinusoidal transmitter voltages, the difference signal having a plurality of sequential zero crossing the method comprising the steps of:

differentiating the sum and difference signals within ±45° of their respective zero crossings to produce respective differentiated signals; and

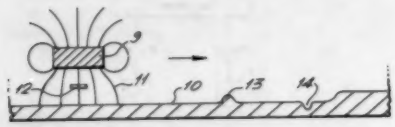
rectifying said differentiated signals in a controlled rectifier which is responsive to the first and second sinusoidal transmitter voltages, to produce the speed-proportional signal having a polarity which corresponds to the direction of rotation of the incremental position generator.

4,468,619

NON-DESTRUCTIVE DETECTION OF THE SURFACE PROPERTIES OF FERROMAGNETIC MATERIALS

Richard Reeves, Lancaster Park, England, assignor to British Gas Corporation, London, England

Continuation of Ser. No. 27,750, Apr. 6, 1979, abandoned, which is a continuation of Ser. No. 870,733, Jan. 19, 1978, abandoned.
This application Sep. 3, 1982, Ser. No. 414,927
Claims priority, application United Kingdom, Jan. 26, 1977, 7703189
Int. Cl.³ G01N 27/82; G01R 33/12
U.S. Cl. 324—220 7 Claims



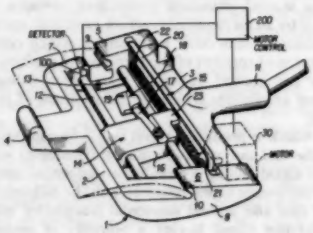
4. Apparatus for the non-destructive inspection of the form of the internal surface of a pipeline of ferromagnetic material, comprising: means for establishing a magnetic field of low strength to avoid generation of flux leakage and such that the internal surface of the pipeline is approximately a magnetic equipotential surface, whereby the lines of flux of the field enter said surface perpendicular thereto at normal profiles thereof; means for moving said means for establishing a magnetic field axially in relation to said pipeline; location means to position said means for establishing adjacent to, but spaced apart from, said surface; and magnetic field sensor means located between said means for establishing a magnetic field and the internal pipeline surface for the measurement of the component of said magnetic field parallel to the pipeline axis and adjacent to the internal pipeline surface caused by imperfections therein.

4,468,620

SYSTEM FOR IN SITU CHECKING OF TURBINE ENGINE BLADES WITH EDDY CURRENT PROBE GUIDANCE APPARATUS

Jean F. Vaerman, Vert Saint Denis, France, assignor to S.N.E.C.M.A., Paris, France

Filed Oct. 16, 1981, Ser. No. 312,352
Claims priority, application France, Oct. 16, 1980, 80 22100
Int. Cl.³ G01R 33/00; G01N 27/90
U.S. Cl. 324—261 8 Claims



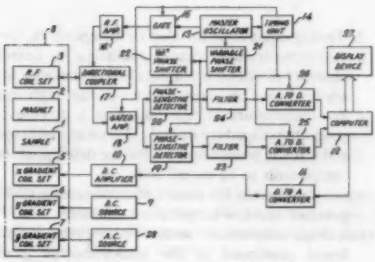
1. A system for the in situ checking of turbine engine blades by eddy currents, said system comprising:
a frame including a first set of two parallel sides;
positioning means on at least one of said sides for holding at least one of the edges of one of said blades;
a detection probe;
means connected to said frame and supporting said probe for rectilinear guidance of said probe parallel to said positioning means; and
means connected to said frame for displacement of said probe along said means for rectilinear guidance,
wherein said positioning means comprises:
two C-shaped hook portions on one of said sides of said frame, a line extending between said hook portion being parallel to said one of said sides; and
a stop attached to the other of said two sides,
wherein the distance between said hook portions and said stop is substantially equal to the width of one of said blades.

4,468,621

INVESTIGATION OF SAMPLES BY N.M.R. TECHNIQUES

Waldo S. Hinshaw, Richmond Heights, Ohio, assignor to National Research Development Corporation, London, England

Filed Jan. 20, 1982, Ser. No. 341,175
Int. Cl.³ G01R 33/08
U.S. Cl. 324—309 8 Claims



1. A method of investigating a sample, the method comprising:
subjecting the sample to a magnetic field having a non-homogeneous component which exhibits a substantially linear field gradient in a given direction relative to the sample;
performing on the sample, while it is subjected to said field, a series of operations in each of which nuclear magnetic resonance of a given nuclear species is caused to occur in the sample by irradiating the sample with at least one pulse of radio frequency energy and in each of which data for a given series of epochs in a time domain related to the timing of the irradiation are derived by sampling signals obtained by coherent detection of signals emitted from the sample as a result of the irradiation, the operations of said series differing substantially only by virtue of the magnitude of said gradient having a different value for each operation; and
obtaining in respect of nuclei of said species in the sample information which is spatially discriminated in a dimension corresponding to said given direction by subjecting data derived from the whole series of operations to processing involving Fourier transformation with respect to the magnitude of said gradient.

4,468,622

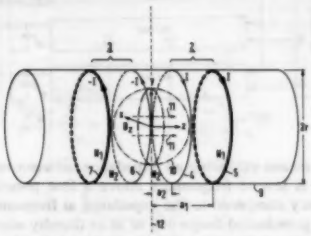
GRADIENT COIL SYSTEM FOR NUCLEAR MAGNETIC RESONANCE APPARATUS

Georg Frese, and Horst Siebold, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,455
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133933
Int. Cl.³ G01R 33/08
U.S. Cl. 324—319 8 Claims

1. A gradient coil system for an image-generating, nuclear

magnetic resonance tomographic apparatus, the gradient coil system is arranged on at least one rotation-symmetrical support body, having an axis which extends along the z-direction of an orthogonal x, y, z coordinate system, the coordinate system having an origin located at the center of an imaging region, the system having a base field magnet for producing a magnet field B_z in the z-direction, the magnet field of said gradient coil system having a field gradient $G_z=\delta B_z/\delta z$ which is essentially constant in the imaging region, the system further having at least two toroidal individual coils arranged symmetrically with respect to an x-y plane of symmetry through the center of the imaging region for conducting current in opposite directions, at least one set of individual coils arrnaged substantially symmetrically with respect to the plane of symmetry for generating a field gradient $G_x=\delta B_z/\delta x$ in the x-direction, which field gradient being substantially constant in the imaging area, and at least one further set of individual coils for generating a further corresponding field gradient $G_y\times\delta B_z/\delta y$ in the y-direction, the gradient coil system being characterized in that the rotation-symmetrical support body has the form of a hollow cylinder having a predetermined radius r, the toroidal individual coils for generating the field gradient G_z are arranged at predetermined distances from the plane of symmetry and each such individual coil has a corresponding linkage factor wherein selected ones of the coils which are further away from the plane of symmetry than others of the coils have substantilly larger linkage factors than said other coils which are nearer to the plane of symmetry.



4,468,623

METHOD AND APPARATUS USING PAD CARRYING ELECTRODES FOR ELECTRICALLY INVESTIGATING A BOREHOLE

Stanley C. Gianzero, Austin, Tex.; David E. Palaith, New Canaan, and David S. K. Chan, Bethel, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jul. 30, 1981, Ser. No. 288,554
Int. Cl.³ G01V *3/20*
U.S. Cl. 324—367 **51 Claims**

8. An apparatus for use with a borehole investigating tool having electrode carrying pads for investigating the wall of a borehole penetrating an earth formation by moving the tool along the borehole axis, the improvement comprising:

a pad adapted to be pressed against the borehole wall, said pad carrying a plurality of measure electrodes mounted on the pad to face the borehole wall and being connected to a source of electrical energy in such manner that respective individually measurable survey currents are injected from respective electrodes into the borehole wall, said measure electrodes being distributed on said pad in an array around a center, with said measure electrodes being so sized and spaced from each other that a measure electrode is intersected along substantially all directions from the center of the array enabling the detection and determination of the orientation of resistivity anomalies indicative of fractures in the earth formation in said borehole wall opposite said array of measure electrodes by measuring said individually measurable survey currents.

19. A method for investigating the earth formation penetrated by a borehole with an electrical current generating tool which is moved along the borehole axis comprising the steps of:

injecting from a pad of the tool as it is moved along the borehole spatially an array of discrete electrical survey currents into the earth formation at the wall of the borehole wherein the survey currents have cross-sections selected to enable detection of fine resistivity anomalies and wherein the spacings between discrete survey currents are so selected that the combined borehole surface area injected by said survey currents extends over a continuous circumferential portion of the borehole wall as the tool is moved along the borehole and with a predetermined circumferential overlap sufficient to measure resistivity anomalies whose spatial frequency is of the order of a characteristic dimension of the discrete survey currents; and

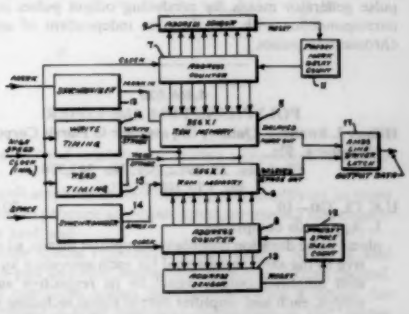
measuring the magnitudes of the discrete survey currents so as to enable detection of resistivity anomalies indicative of fracturing and stratigraphy in the earth formation segments in which the survey currents are injected.

4,468,624

PROGRAMMABLE SYNCHRONOUS DIGITAL DELAY LINE

Thomas J. Rehbein, Taberg, and Wayne Bonser, Poland, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 23, 1980, Ser. No. 171,913
Int. Cl.³ H03K *3/017, 3/86, 5/14*
U.S. Cl. 328—55 **14 Claims**



1. A programmable synchronous digital delay line comprising:

means operating on a single frequency source clock for providing bipolar input data in the form of a mark data

pulse stream representing the leading edges of input data pulses and a space data pulse stream representing the trailing edges of input data pulses,

first and second programmable digital delay means,

a write circuit for writing said mark data pulse stream into said first programmable digital delay means and said space data pulse stream into said second programmable delay means,

a read circuit for reading mark and space data pulses out of said first and second programmable digital delay means, and

a line driver latch output, said line driver latch receiving read out mark and space data pulses from said first and second programmable delay means and generating data output pulses therefrom.

4,468,625

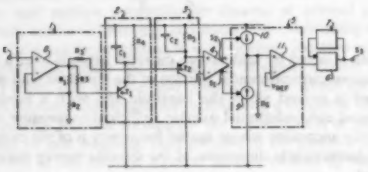
CIRCUIT FOR DETECTING SYNCHRONIZATION PULSES IN A COMPOSITE SIGNAL

Pascal R. Tandart, Saint Paul De Vence, and Jean L. Villevielle, Saint Laurent Du Var, both of France, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 26, 1981, Ser. No. 315,073

Int. Cl.³ H03B *1/00*; H03K *5/22, 5/153*

U.S. Cl. 328—139 **13 Claims**



1. Circuit for detecting and regenerating synchronization pulses in a composite signal constituted by synchronization pulses alternating with information signals, comprising first detector means for detecting and storing the peak values of said synchronization pulses; second detector means for following and storing the envelope value of the composite signal; comparator means having inputs for receiving the values stored by said first and second detectors respectively and for producing an output which assumes a first state when the difference between the said stored values is less than a predetermined value, and a second state when the difference between the said stored values is greater than the said predetermined value, and means responsive to changes of said output between said first and second values to control operation of pulse generator means for producing output pulses in timed correspondence with and duration independent of said synchronization pulses.

4,468,626

POLYPHASE PDM AMPLIFIER

Hilmer I. Swanson, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 25, 1982, Ser. No. 342,374

Int. Cl.³ H03F *3/38*

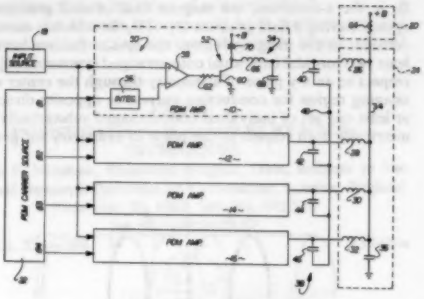
U.S. Cl. 330—10 **20 Claims**

1. Apparatus comprising:

plural pulse duration modulation amplifier means, all responsive to the same input signal for each providing an associated amplifier output signal on its respective amplifier output, each said amplifier output signal including a spurious component introduced by the pulse duration modulation amplification process, said spurious components of the plural said amplifier output signals being out of phase with one another;

combiner means for combining the plural amplifier output signals provided by said plural pulse duration modulation amplifier means to provide a combined signal; and

frequency selective circuit means connected between the amplifier outputs of said plural amplifier means, said circuit means exhibiting an impedance between said outputs that is low at frequencies above a first preselected frequency compared to the impedance at frequencies below said preselected frequency so as to thereby attenuate said spurious components in said combined signal.



4,468,627

RIAA EQUALIZER CIRCUIT

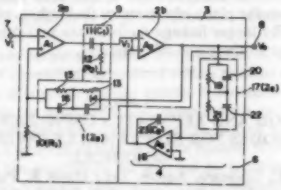
Tatsuo Fushiki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 16, 1982, Ser. No. 408,284

Claims priority, application Japan, Aug. 17, 1981, 56-128334

Int. Cl.³ H03F *3/191*

U.S. Cl. 330—107 **10 Claims**



1. An equalizer circuit comprising:

an input signal terminal for receiving an input signal;

amplifying means coupled to said input signal terminal for amplifying in accordance with a RIAA equalization characteristic said input signal applied to said input signal terminal;

an output signal terminal for outputting said amplified input signal;

first equalizer element means connected at its one end to said output signal terminal and having an impedance corresponding to an inverse RIAA equalization characteristic;

direct current component detecting means connected to the other end of said first equalizer element means for deriving a direct current component from the output appearing at said other end;

negative feedback circuit means for negatively feeding back said derived direct current component to said amplifying means as a negative feedback signal thereof;

said amplifying means having a non-inverting input terminal coupled to said input signal terminal, an inverting input terminal coupled to ground, and an output terminal coupled to said output signal terminal;

second equalizer element means coupled between said

output and inverting input terminals of said amplifying means and having an impedence corresponding to an inverse RIAA equalization characteristic; and

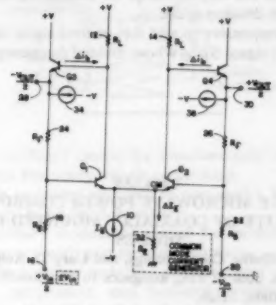
first resistor means coupled in series with said second equalizer element means between said output terminal of said amplifying means and grounds.

4,468,628

DIFFERENTIAL AMPLIFIER WITH HIGH COMMON-MODE REJECTION

Winthrop A. Gross, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 17, 1983, Ser. No. 458,383
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—258 **5 Claims**



1. A differential amplifier, comprising:

an input signal path;

a first and second transistor for receiving said input signal, the emitters of which are coupled together in common;

a constant current generator connected to the common emitters of said first and second transistors;

a first and a second shunt feedback path, said first shunt feedback path including a third transistor arranged as an emitter follower connected between the collector and base of said first transistor and said second shunt feedback path including a fourth transistor arranged as an emitter follower connected between the collector and base of said second transistor;

first and second output terminals coupled to the emitters of said third and fourth transistors, respectively; and

means coupled to the common emitters of said first and second transistors to generate a current change to offset the base current change of said third and fourth transistors in response to common-mode components of said input signal.

4,468,629

NPN OPERATIONAL AMPLIFIER

John Choma, Jr., Hacienda Heights, Calif., assignor to TRW Inc., Redondo Beach, Calif.

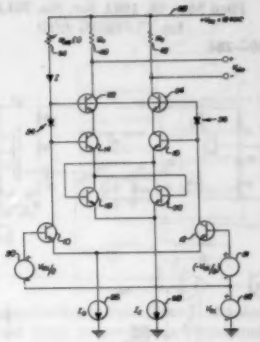
Filed May 27, 1982, Ser. No. 363,364
Int. Cl.³ H03F *3/45, 1/42*
U.S. Cl. 330—260 **10 Claims**

9. An NPN operational amplifier having an extremely high gain-band width product, said amplifier comprising:

A first differential pair of NPN transistors connected to receive an input signal across their bases;

A second differential pair of NPN transistors connected to receive as an input across their bases the differential output signal from said first differential pair of transistors, and supply a differential output signal at their collector; and

A negative resistance circuit connected to the emitters of transistors in said second differential pair, to produce an extremely high amplifier gain, whereby the use of NPN transistors throughout said amplifier maximizes the band width of said circuit, wherein said negative resistance circuit includes:



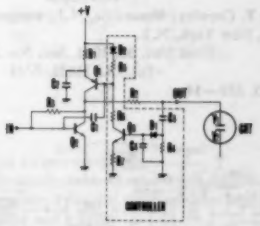
A further pair of NPN transistors, having their bases cross-coupled to their collectors, and having their collectors connected to respective emitters of said second differential transistor pair.

4,468,630

WIDE-BAND AMPLIFIER FOR DRIVING CAPACITIVE LOAD

Yasunori Narukawa, and Mitsunobu Iwabuchi, both of Tokyo, Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,221
Claims priority, application Japan, Aug. 8, 1981, 56-124384
Int. Cl.³ H03F *3/26;* H03G *5/16*
U.S. Cl. 330—267 **4 Claims**



1. A wide-band amplifier for driving a capacitive load comprising:

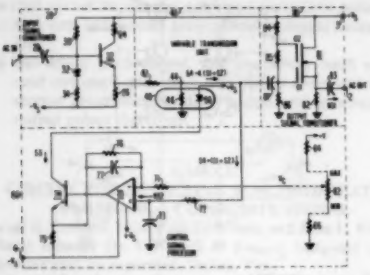
push-pull amplifier means receiving and amplifying an input signal to produce an output signal for driving said capacitive load; and

controller means responsive to said output signal of said push-pull amplifier means to control bias current thereof, said controller means further comprising a circuit for extracting a high frequency component in said output signal of said push-pull amplifier, a detector circuit for detecting an extracted output signal, and a circuit responsive to a detector output signal to control bias current of one transistor constituting said push-pull amplifier means.

4,468,631
AMPLITUDE CONTROL APPARATUS

Selwyn B. Goldberg, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,621
Int. Cl.³ H03G 3/30
U.S. Cl. 330—284 3 Claims



1. Amplitude control apparatus, comprising: input means for receiving an input signal and providing a resultant signal inclusive of an AC component proportional to amplitude variations of said input signal and a DC component of constant amplitude;

an output node for providing a processed output signal;

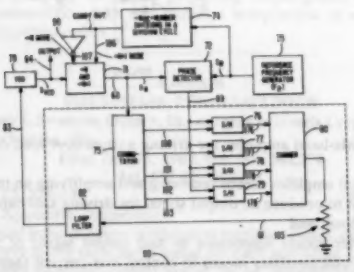
attenuator means having a series branch for coupling said resultant signal to said output node and a shunt branch for coupling said output node to a point of reference potential, each branch including an impedance element; and

feedback control means having a first input coupled to said output node, a second input coupled to receive a gain control signal and an output for supplying a feedback control signal to at least one of said impedance elements for regulating the amplitude of the DC component of said processed output signal in accordance with the amplitude of said gain control signal.

4,468,632
PHASE LOCKED LOOP FREQUENCY SYNTHESIZER INCLUDING FRACTIONAL DIGITAL FREQUENCY DIVIDER

Albert T. Crowley, Somerdale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 326,152
Int. Cl.³ H03L 7/18
U.S. Cl. 331—14 7 Claims



1. In a fractional frequency synthesizer comprising a voltage-controlled oscillator (VCO) for generating an output signal S_{VCO} of frequency F_{VCO}, dividing means for dividing F_{VCO} in division cycles with each division cycle consisting of the division of F_{VCO} by N, Y times, and by (N+M), Z times, in an iterative manner to produce a divided output signal S_N of frequency F_N, where the division ratio is

$$N + M\frac{Z}{Y+Z}$$

and N, Y, M and Z are integers, a reference signal generating means for generating a reference signal S_R of frequency F_R, and phase detector means responsive to S_N and S_R to produce an output signal whose amplitude is representative of the phase therebetween; a control circuit comprising:

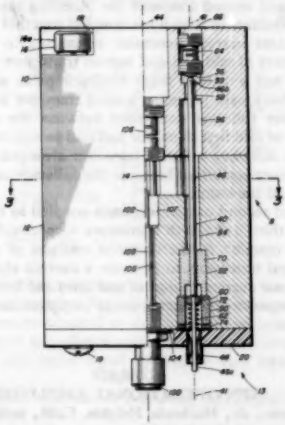
means for detecting and averaging the output signals from said phase detector means during each division of F_{VCO} in each division cycle to produce a d.c. control signal whose amplitude is substantially constant and proportional to the average of the amplitudes of the detected output signals over each division cycle;

said VCO responsive to said d.c. control signal to generate an output signal S_{VCO} whose divided frequency $F_N = F_R$.

4,468,633
ADJUSTABLE MICROWAVE POWER COMBINER FOR A PLURALITY OF COAXIALLY MOUNTED IMPATT DIODES

Ronald L. Chilluffo, Coral Springs, and Gary D. Kelpien, Pompano Beach, both of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 28, 1982, Ser. No. 372,596
Int. Cl.³ H03B 7/14, 9/12
U.S. Cl. 331—56 8 Claims



1. A microwave power combiner comprising:

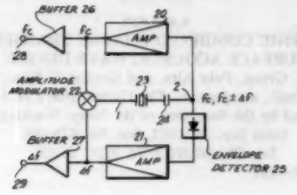
a resonator cavity;

a plurality of coaxial circuits, each having a longitudinal axis, a solid state microwave diode at one end of the circuit, and means coupling said diode to said resonator cavity comprising, in series, a first transmission line of adjustable length having one end connected to said diode, a second transmission line forming a fixed impedance transformer having an end connected to the other end of said first transmission line of adjustable length, and a third transmission line of fixed length connected between the other end of said fixed impedance transformer and said resonator cavity.

4,468,634
CRYSTAL OSCILLATOR PRODUCING TWO FREQUENCIES BY MEANS OF AMPLITUDE MODULATION AND DEMODULATION

Michiaki Takagi, and Eishi Momosaki, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 17, 1981, Ser. No. 322,319
Claims priority, application Japan, Nov. 18, 1980, 55-162397; Dec. 10, 1980, 55-174170
Int. Cl.³ H03B 5/36, 25/00
U.S. Cl. 331—60 9 Claims



1. An oscillator circuit for simultaneously outputting first and second frequency signals comprising:

a single resonator vibrating in two modes at said first frequency and a third frequency;

an amplitude modulating circuit for modulating said first frequency with said second frequency;

a feedback circuit including said resonator and passive circuit components, said feedback circuit receiving said amplitude modulated signal;

a detector operating on said amplitude modulated signal from said feedback circuit, the output signal of said detector being at said second frequency, said output signal of said detector being input to said amplitude modulating circuit for modulating said first frequency signal;

first amplifier means directly amplifying an output signal of said feedback circuit, said amplified signal being input to said amplitude modulator as said first frequency for modulation; and

second amplifier means operating on said output signal from said detector, the output of said second amplifier means being said second frequency input to said amplitude modulation circuit, said first and third frequencies being close together in value and said second frequency modulating signal is the difference frequency of said first and third frequencies.

4,468,635
TRANSMISSION LINE BIASED COHERENT ARRAY OF JOSEPHSON OSCILLATORS

James E. Lukens; Aloke K. Jain, both of Stony Brook, and Paul M. Mankiewich, East Setauket, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1981, Ser. No. 258,704
Int. Cl.³ H03B 15/00; H01L 39/14
U.S. Cl. 331—107 S 7 Claims

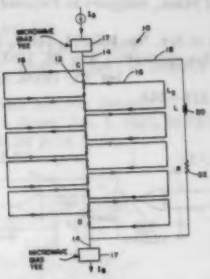
1. Apparatus suitable for use as a tunable, wideband microwave oscillator comprising:

a central conductor having a gap;

a source of biasing current connected to said central conductor;

a line array of a plurality of hysteresis-free Josephson junctions operatively connected in said gap and selectively spaced along a longitudinal axis;

A plurality of interlocking superconducting loops of an inductance L_s shunted across adjacent pairs of said hysteresis-free Josephson junctions to produce equal and opposite dc bias voltages across said adjacent pairs of said hysteresis-free Josephson junctions to provide a common frequency of operation; and

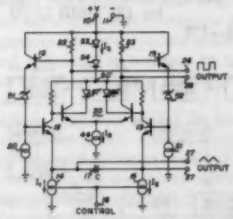


a feedback loop, having an inductance L, shunted around the ends of said array to produce a circulating rf current through said array to provide phase coherence.

4,468,636
LOW TEMPERATURE COEFFICIENT WIDE BAND-WIDTH VOLTAGE CONTROLLED OSCILLATOR

Dennis M. Monticelli, Fremont, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 3, 1981, Ser. No. 289,334
Int. Cl.³ H03K 3/282
U.S. Cl. 331—113 R 5 Claims



1. In an oscillator circuit comprising:

a first pair of transistors each of which has a series current source in its emitter, a parallel diode-resistor load in series with its collector and a base;

a pair of emitter followers each having an output coupled to one of said bases of said first pair of transistors and an input cross coupled the collector of the opposite transistor of said first pair of transistors; and

a capacitor coupled between said emitters of said first pair of transistors whereby said circuit oscillates at a frequency determined by the values of said capacitor and current sources;

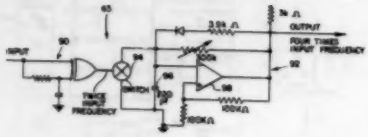
the improvement comprising:

a differential amplifier having a pair of inputs coupled respectively to the collector electrodes of said first pair of transistors and a pair of outputs coupled respectively to said inputs of said pair of emitter followers whereby the differential amplifier provides said cross coupling between said inputs of said emitter followers.

4,468,637
SYNCHRONIZABLE OSCILLATOR

William R. Wray, Sudbury, and James Burkhardt, Watertown, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 166,101, Jul. 7, 1980, Pat. No. 4,307,946. This application Aug. 26, 1981, Ser. No. 296,351
Int. Cl.³ H03K 3/023
U.S. Cl. 331—143 2 Claims



1. An oscillator circuit comprising:

an oscillator unit employing a charge storage device, said unit being energizable for periodically charging and discharging said storage device to produce a selected frequency at the output of said oscillator unit;

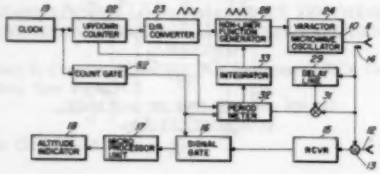
switching means operable for discharging said charge storage device; and

means comprising a zero-crossing multiplier driven by a given input frequency for actuating said switching means in relation to the input frequency so as to discharge said storage device at each zero-crossing of the multiplier, and thereby continually resynchronize the output of said oscillator unit with respect to said given frequency.

4,468,638
LINEAR SWEEP FREQUENCY MODULATOR FOR FM/CW RADIO ALTIMETER

Constantinos S. Kyriakos, Deerfield Beach, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 11, 1982, Ser. No. 347,839
Int. Cl.³ H03B 23/00
U.S. Cl. 331—178 14 Claims



1. A linear sweep frequency modulator for an electronically tunable continuous wave oscillator having a non-linear frequency versus frequency control voltage characteristic, comprising:

means providing a modulation wave having an amplitude varying linearly with time through substantially the entire cycle thereof;

a non-linear function generator receiving said linear modulation wave and converting said linear wave to a non-linear wave synchronized with said linear wave, said non-linear wave being applied to said oscillator as said frequency control voltage, said non-linear wave being of such form as to cause the frequency of said oscillator to vary linearly in synchronism with said linear modulation wave for a particular frequency versus frequency control voltage characteristic of said oscillator;

means for varying the form of said non-linear wave produced by said non-linear function generator to cause the frequency of said oscillator to vary linearly in synchronism with said linear modulation wave for a frequency control voltage versus frequency characteristic of said oscillator other than said particular one;

means providing an oscillatory calibration signal the period of which is indicative of the linearity of frequency modulation of said oscillator;

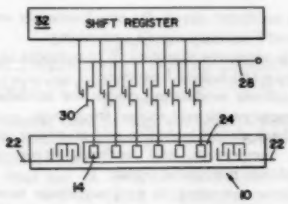
means for determining variations in the period of said calibration signal; and

means for applying said variations in said calibration signal period to said means for varying the form of said non-linear wave in such sense as to cause said variations in said calibration signal period to be reduced.

4,468,639
MONOLITHIC COMBINED CHARGE TRANSFER AND SURFACE ACOUSTIC WAVE DEVICE

Jonathan B. Green, Palo Alto, and Gordon S. Kino, Stanford, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,405
Int. Cl.³ H03H 9/64, 9/30, 15/02
U.S. Cl. 333—153 8 Claims



1. A monolithic, programmable apparatus for performing high-frequency, high-speed signal processing under the control of low-frequency, low-speed electrical signals comprising:

(a) a semiconductor substrate having in its central region an integrated circuit array of charge carriers;

(b) an insulating oxide layer, said layer grown over said array of said charge carriers and extending over the entire upper surface of said substrate;

(c) a pair of conducting pads deposited upon said oxide layer, said pads located at oposite ends of said substrate;

(d) a film of a piezoelectric material deposited over said conducting pads and the entire surface of said oxide layer;

(e) means for inserting an electroacoustic signal into said substrate, said inserting means also having capability for retrieving said signal;

(f) means for addressing each of said charge carriers selectively such that the charge in each of said carriers may be sampled and regulated, said addressing means permitting storage of said electroacoustic signal and any selective modulation of said signal;

(g) means for inputting an analog signal to said addressing means; and

(h) means for controlling said addressing means with said low-speed, low-frequency electrical signals.

4,468,640
ADAPTIVE FILTER UPDATE NORMALIZATION

Charles W. K. Gritton, North Brunswick, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

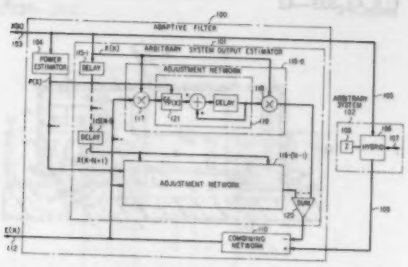
Filed Jun. 28, 1982, Ser. No. 393,122
Int. Cl.³ H03H 15/00
U.S. Cl. 333—166 16 Claims

1. In an adaptive transversal filter of the type including:

a plurality of means each for generating a corresponding one of a plurality of amplitude coefficient signals, said plurality of amplitude coefficient signals forming an impulse response, each of said amplitude coefficient signal gener-

ating means including controllable gain means responsive to a normalization control signal for normalizing gain used in updating said corresponding amplitude coefficient signal;

means responsive to a received signal for generating the normalization control signal, said normalization control signal generating means including,



means for generating a plurality of representations of a prescribed characteristic of the received signal and

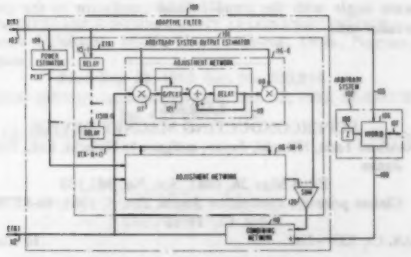
means for selecting one of said plurality of representations in accordance with a prescribed criterion as said normalization control signal.

4,468,641

ADAPTIVE FILTER UPDATE NORMALIZATION

Donald L. Duttweiler, Rumson; Charles W. K. Gritton, North Brunswick, and Ying G. Tao, Old Bridge, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1982, Ser. No. 393,124
Int. Cl.³ H03H *15/00*
U.S. Cl. 333—166 **9 Claims**



1. In an adaptive transversal filter of the type including:

a plurality of means each for generating a corresponding one of a plurality of amplitude coefficient signals, said plurality of amplitude coefficient signals forming an impulse response, each of said amplitude coefficient signal generating means including controllable gain means responsive to a normalization control signal for normalizing gain used in updating said corresponding amplitude coefficient signal;

means for generating said normalization control signal including,

means responsive to a received signal for generating a first normalization signal representative of a first prescribed characteristic of the received signal,

means responsive to the received signal for generating at least a second normalization signal representative of at least a second prescribed characteristic of the received signal, and

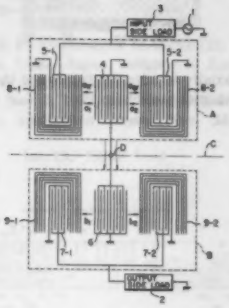
means for selecting in accordance with a prescribed criterion either said first normalization signal or said at least second normalization signal as said normalization control signal.

4,468,642

BAND PASS FILTER DEVICE

Mitsutaka Hikita, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 386,068
Claims priority, application Japan, Jun. 5, 1981, 56-85720
Int. Cl.³ H03H *9/64, 9/145*
U.S. Cl. 333—193 **12 Claims**



1. A band pass filter device comprising:

a first band pass filter including a first acousto-electric transducer and first electro-acoustic transducers disposed on opposite sides of the first acousto-electric transducer and adapted for connection in common to an input signal source, said first acousto-electric transducer having pairs of fingers;

a second band pass filter including a second electro-acoustic transducer connected electrically to said first acousto-electric transducer and second acousto-electric transducers disposed on opposite sides of the second electro-acoustic transducer and connected in common to an output terminal, said second electro-acoustic transducer having pairs of fingers, and

said first acousto-electric transducer having the same structure as that of said second electro-acoustic transducer in which the number N of pairs of fingers in each of said first acousto-electric transducer and said second electro-acoustic transducer substantially is equal to $1.5/k^2$, where k^2 represents the electromechanical coupling constant of a piezoelectric plate on which said fingers are formed and is expressed by $k^2=2(v_f-v_m)v_f$, v_f representing the velocity of a surface acoustic wave propagating along a free surface of said plate and v_m representing the velocity of a surface acoustic wave propagating along a thin metal coated portion of the surface of said plate.

4,468,643

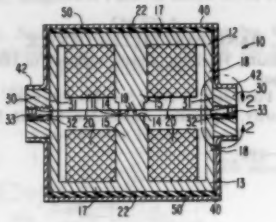
MAGNETIC CIRCUIT ADJUSTABLE BY TAPERED SCREWS

Dale M. Barger, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 6, 1982, Ser. No. 395,392
Int. Cl.³ H01P *1/218*; H01F *3/00*
U.S. Cl. 333—202 **9 Claims**

1. A method of causing resonators of a multi-stage electromagnetically-tuned filter disposed inside a magnetic field region to resonate at a same frequency while said filter is operating, said method comprising the step of providing a small number of tapered machine screws, the tapered parts of

which are generally in contact with and sandwiched between two magnet assemblies and the step of moving one or more of



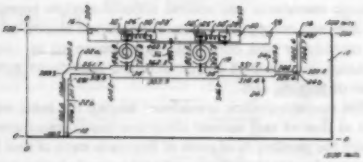
said screws axially to adjustingly change the relative orientation of said magnet assemblies.

4,468,644

TUNABLE REJECT FILTER FOR RADAR WARNING RECEIVER

Randy Teague, Plainview; Lawrence H. Silverman, Dix Hills, and Novellone Rozario, Jericho, all of N.Y., assignors to General Instrument Corp., Clifton, N.J.

Filed Sep. 23, 1982, Ser. No. 421,971
Int. Cl.³ H01P 1/203; H03H 7/01
U.S. Cl. 333—205 **14 Claims**



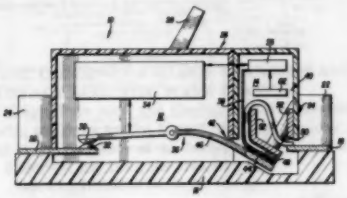
1. A band reject filter tunable in the microwave range, usable in conjunction with a bias voltage signal generator and a reference signal source, and adapted to be formed on a substrate, said filter comprising: input means; output means; first and second conductive strips situated at spaced locations on the substrate; first impedance transformer means operably connected between said input means and one end of said first strip; second impedance transformer means operably connected between the other end of said first strip and said output means; means for operably connecting said reference source and said second strip; and shunt tuning means operably connected between said first and second strips, said shunt means comprising: first and second capacitor means, each of said capacitor means having a first terminal operably connected to said second strip, and a second terminal; RF choke means operably connected between said second terminals of said first and second capacitor means; varactor means having a first terminal operably connected to said second terminal of said first capacitor means, and a second terminal; discrete inductor means operably connected between said second terminal of said varactor means and said first conductive strip; and means operably connected to said second terminal of said second capacitor means for receiving the bias signal.

4,468,645

MULTIPOLE CIRCUIT BREAKER WITH REMOVABLE TRIP UNIT

Alain Gerbert-Gaillard, Vourey, and Robert Morel, Eybens, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Sep. 15, 1982, Ser. No. 418,422
Claims priority, application France, Oct. 5, 1981, 81 18840
Int. Cl.³ H01H 73/06
U.S. Cl. 335—42 **6 Claims**



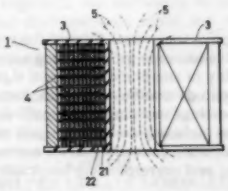
1. A multipole electric circuit breaker with a molded housing including a bottom wall and two end walls, comprising a circuit breaker unit including separable contacts and an operating mechanism for said contacts, and a removable trip unit including tripping elements associated with the different poles for actuating said operating mechanism in case of overload and fault, said trip unit comprising, for each pole, a first section of a power conductor having at one end a disconnectable connection part, and said circuit breaker unit comprising, for each pole, a second section of a conductor enclosing the contacts and having at one end another disconnectable connection part, the conductor in the circuit breaker unit extending generally parallel to said bottom wall, the connection of the pair of connection parts providing the series connection of said first and second sections of power conductor, said disconnectable connection parts each having a connection end making an acute angle with the trend to said conductor in the circuit breaker unit.

4,468,646

SUPERCONDUCTING MAGNET DEVICE

Naofumi Tada, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,103
Claims priority, application Japan, Jun. 5, 1981, 56-85750
Int. Cl.³ H01F 7/22
U.S. Cl. 335—216 **10 Claims**



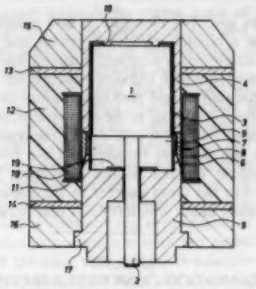
1. A superconducting magnet device which comprises a coil of intermetalllic compound superconducting wires wound upon a core of said device in parallel and in multiple layers together with wires of a stabilizing material for thermally stabilizing said superconducting wires,

said wires of the stabilizing material being oxygen-free copper wires which are hardened by a cold working process before being wound upon said coil core.

4,468,647
ACTIVATING MAGNET

Christoph Gibas, Neunkirchener, Fed. Rep. of Germany, assignor to bso Steuerungstechnik GmbH, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,645
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239345
Int. Cl.³ H01F 7/08
U.S. Cl. 335—262 2 Claims

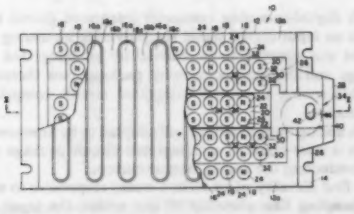


1. Activating magnet comprising two coaxial pole tube portions which are spaced from each other and have the same inner and outer diameters, said pole tube portions are connected with each other by a connecting ring containing solder, a spacing ring made of a non-magnetizable material and surrounded by the connecting ring is arranged between the two pole tube portions, said spacing ring is thinner than the two pole tube portions, whereby the connecting ring has the same outer diameter and the spacing ring has the same inside diameter as the pole tube portions, or vice versa.

4,468,648
SWITCHABLE PERMANENT MAGNETIC CHUCK

Mamoru Uchikune, 18-25, Chuo 1-chome, Ueda, Nagano, Japan

Filed Sep. 22, 1983, Ser. No. 535,914
Claims priority, application Japan, Oct. 15, 1982, 57-155170
Int. Cl.³ H01F 7/04
U.S. Cl. 335—295 3 Claims

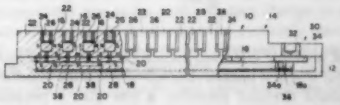


1. A switchable permanent magnetic chuck comprising a frame structure made of non-magnetic material, a bottom plate to cover a bottom opening of the frame structure, a work supporting faceplate disposed to cover a top opening of the frame structure and provided with a plurality of magnetic pole face portions magnetically insulated from one another and arranged with a predetermined pitch in one direction, a shiftable plate accomodated in the frame structure in parallel with the work supporting faceplate and adapted to be movable in the direction of the arrangement of the magnetic pole face portions, a plurality of stationary permanent magnets arranged with the same pitch as the pitch of the magnetic pole face portions to face them by the sides of the shiftable plate along the direction of the movement of the shiftable plate and magnetized in the thickness direction of the shiftable plate and a plurality of movable permanent magnets supported on the shiftable plate for integral movement therewith, arranged with the same pitch as the pitch of said stationary permanent magnets along the direction of the movement of the shiftable plate and magnetized in the thickness direction of the shiftable plate, the stationary and movable permanent magnets being made of a high coercive force magnet, and the magnetization directions of the stationary and movable permanent magnets being respectively alternately inversed along the respective directions of their arrangements.

4,468,649
SWITCHABLE PERMANENT MAGNETIC CHUCK

Takeo Matsuhashi, Ueda, Japan, assignor to Kanetsu Kogyo Kabushiki Kaisha, Nagano, Japan

Filed Nov. 8, 1983, Ser. No. 549,994
Claims priority, application Japan, Nov. 24, 1982, 57-176486[U]
Int. Cl.³ H01F 7/04
U.S. Cl. 335—295 7 Claims



1. A switchable permanent magnetic chuck including:
a housing having one open end;
a face plate comprising a plurality of elongated magnetic pole members and a plurality of elongated non-magnetic members, said magnetic pole members and said non-magnetic members being arranged in an alternately juxtaposed manner across said open end of said housing so as to cover said open end;
a plurality of first permanent magnets each disposed between adjacent said magnetic pole members of the face plate so as to give alternately inverted magnetized directions in the transverse direction of said magnetic pole members; and
a plurality of second permanent magnets arranged and supported on a movable member in a corresponding relation to said magnetic pole members for bringing said face plate selectively into magnetically excited and non-excited states in cooperation with said first permanent magnets, said second permanent magnets having magnetic pole faces slidably opposed to said magnetic pole members, said movable member being enclosed in said housing so as to be movable in the transverse direction of said magnetic pole members and said non-magnetic members.

4,468,650
LOW TIRE PRESSURE ALARM SYSTEM

J. Brent Barbee, Nashville, Tenn., assignor to Kanetsu Kogyo Kabushiki Kaisha, Nagono, Japan

Filed Sep. 30, 1982, Ser. No. 431,590
Int. Cl.³ B60C 23/00
U.S. Cl. 340—58 6 Claims

1. An alarm system for monitoring the air pressure in each of the pneumatic tires on a pair of coaxial dual inboard and outboard vehicle wheels, the outboard wheel having a hub, and inboard and outboard air valves in fluid communication with the interior of each corresponding tire, comprising:
(a) a pneumatic cylinder,
(b) a piston reciprocably mounted in said cylinder and defining an inboard detector chamber in one end of said cylinder on one side of said piston and an outboard detector

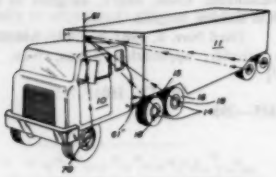
chamber in the other end of said cylinder on the other side of said piston member,

(c) an inboard fluid conduit coupled in fluid communication between said inboard detector chamber and the inboard air valve,

(d) an outboard fluid conduit coupled in fluid communication between said outboard detector chamber and the outboard air valve,

(e) a sensor comprising first and second axially spaced movable switch elements movable with said piston, and first and second fixed switch elements axially spaced on said cylinder and in alignment with the reciprocal path of said movable switch elements,

(f) signal generating means associated with said sensor and being adapted to generate a first alarm signal when said



first movable and fixed switch elements are adjacent each other in a first operative position when the pressure in said inboard detector chamber is less than a predetermined value, and to generate a second alarm signal when said second movable and fixed switch elements are adjacent each other in a second operative position when the air pressure in said outboard detector chamber is less than a predetermined value,

(g) an alarm device adapted to be actuated by either said first or second alarm signals to indicate corresponding low pressure in the inboard tire or the outboard tire, and

(h) mounting means mounting said cylinder on the hub of a vehicle wheel, so that the mass of said cylinder, said piston and said switch elements is substantially equally distributed concentrically of the hub.

4,468,651

METHOD FOR ELIMINATING THE ZERO POINT ERROR IN AN ITERATIVE ANALOG-DIGITAL CONVERTER

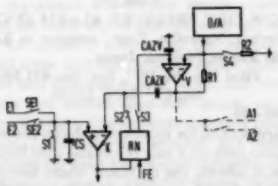
Robert Lechner, Otterfing; Frithjof von Sichart, Munich, and Peter Pleard, Taufkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,625

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1980, 3031592

Int. Cl.³ H03K *13/08*

U.S. Cl. 340—347 CC **3 Claims**



1. A method for the zero point equalization of an operational amplifier used an an analog quantity comparator in an analog-digital converter, such comparator having first and second inputs connected respectively to the output of the digital-analog coverter and to an analog signal to be converted, said digital-analog coverter operating according to the iterative principle, comprising the steps of:

connecting a zero equalization capacitor in circuit with said first input at the beginning of an equalization phase, setting the output singal of the digital-analog converter and said second input equal to a reference potential,

and connecting a feedback network between the output of the comparator and its said first input, whereby said capacitor is charged and the output signal of the comparator arrives at the decision threshold between the equality and inequality of the analog values at the comparator inputs, and

wherein the amplifier elements of said comparator are designed as a bipolar integrated circuit and including the steps of employing a feedback network having a constant current source which delivers a current for compensating the discharging of said zero equalization capacitor by the input current delivered to the comparator, and connecting said constant current source during the equalization phase to attain the decision threshold of the comparator, and said constant current source delivering slightly more current than the input current to the comparator during the operating phase which follows said equalization phase.

4,468,652

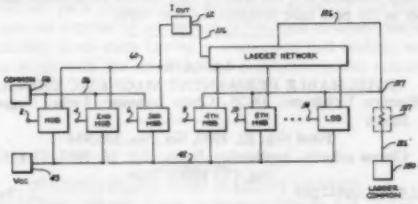
DIGITAL-TO-ANALOG CONVERTER HAVING LADDER NETWORK AND IMPROVED INTERCONNECTION THEREFOR

Anthony D. Wang, and Donald L. Brumbaugh, both of Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

Continuation of Ser. No. 250,867, Apr. 3, 1981, abandoned. This application Sep. 22, 1982, Ser. No. 421,506

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **7 Claims**



1. A digital-to-analog converter integrated circuit responsive to an input digital signal for providing an analog output current and adapted to be carried by an integrated circuit package and interconnected with package pins thereof, said digital-to-analog converter integrated circuit comprising in combination:

a. an analog output current pad adapted to be interconnected by a wire bond to an integrated circuit package pin for conducting the analog output current;

b. a first plurality of bit switch means responsive to a corresponding first plurality of bits within the input digital signal for selectively switching current through output nodes thereof and selectively switching current through waste current nodes thereof, said first plurality of bits each having a binary weighting;

c. a second plurality of bit switch means responsive to a corresponding second plurality of bits within the input digital signal for selectively switching current through output nodes thereof and selectively switching current through waste current nodes thereof, said second plurality of bits each having a binary weighting of lesser significance than the binary weighting of said first plurality of bits;

d. a first conductive metal trace formed within the integrated circuit and directly coupled to said analog output

current pad for coupling the output nodes of said first plurality of bit switch means to said analog output current pad and for conducting the current switched through the output nodes of said first plurality of bit switch means to said analog output current pad, said first conductive metal trace having a finite resistance associated therewith across which a voltage drop is produced of a magnitude which varies in accordance with the amount of current conducted thereby;

e. ladder network means coupled to the output nodes of said second plurality of bit switch means for dividing the current conducted through the output node of each of said second plurality of bit switch means and supplying a binary weighted portion of said divided current to an output of said ladder network means; and

f. a second conductive metal trace formed within the integrated circuit and directly coupled to said analog output current pad for coupling the output of said ladder network means to said analog output current pad and for conducting said binary weighted portion of said divided current to said analog output current pad, said second conductive metal trace having a finite resistance associated therewith across which a voltage drop is produced of a magnitude which varies in accordance with the amount of current conducted thereby, said second conductive metal trace being separate and apart from said first conductive metal trace for avoiding any voltage drops within said second conductive metal trace due to current switched through the output nodes of said first plurality of bit switch means and thereby substantially minimizing linearity errors in said binary weighted portion of said divided current which linearity errors arise from switching transitions within said first plurality of bit switch means.

4,468,653

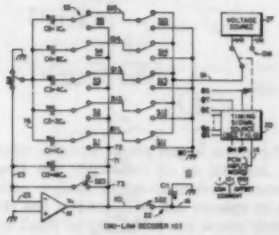
CHARGE REDISTRIBUTION MU-LAW PCM DECODER

Christopher W. Kapral, San Carlos, Calif., assignor to GTE Network Systems Incorporated, Phoenix, Ariz.

Continuation-in-part of Ser. No. 307,823, Oct. 2, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 558,565

Int. Cl.³ H03K *13/17*

U.S. Cl. 340—347 DA **41 Claims**



1. Apparatus for decoding PCM code words and producing associated analog signals, each word including first, second and third code groups of one or more binary bits each which define the polarity, prescribed segment, and step offset within the prescribed segment for an associated analog signal sample, said apparatus comprising:

first capacitor means having one and other sides thereof and having a net normalized capacitance C1=mCo, where m is an integer and Co is a normalized capacitance;

second capacitor means having one and other sides thereof and having a capacitance C2=nmCo, that is an integral multiple of the principal number n of steps within each segment;

third capacitor means having pluralities of one and other sides thereof and having a total-net normalized capacitance which is substantially Cs=nmCo−mCo=(n−1)-mCo;

first means for impressing one of a positive and negative prescribed reference voltage on a first bus line; and

first switch means responsive to the second and third code groups (a) for cyclically connecting one and other sides of said first and third capacitor means to a ground reference voltage and said first bus line, respectively, for charging the associated capacitances with the one prescribed reference voltage, and connecting said one and other sides of said first and third capacitor means simultaneously to associated sides of said second capacitor means for redistributing charge on said capacitances a first prescribed number of times (which may be zero) associated with a segment that is designated by the second code group; (b) for subsequently first connecting said one and other sides of said first and third capacitor means to ground and to ones of said first bus line and ground, respectively, so as to impress a charge on capacitances of said first and third capacitor means that corresponds to the step offset designated by the third code group in the prescribed segment designated by the second code group, and then simultaneously connecting said one and other sides of said first and third capacitor means to associated sides of said second capacitor means for redistributing charge on capacitances thereof; and (c) subsequently cyclically connecting said one and other sides of said first and third capacitor means both to ground, and then connecting said one and other sides of said first and third capacitor means to associated sides of said second capacitor means for redistributing the charge on the connected capacitor means a number of times corresponding to segments that are above the prescribed segment specified by the second code group and containing the step offset defined by the third code group.

4,468,654

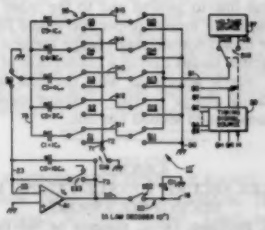
CHARGE REDISTRIBUTION A-LAW PCM DECODER

Christopher W. Kapral, Belmont, Calif., assignor to GTE Network Systems Incorporated, Phoenix, Ariz.

Continuation-in-part of Ser. No. 307,821, Oct. 2, 1981,. This application Dec. 5, 1983, Ser. No. 558,567

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **51 Claims**



1. Apparatus for converting PCM coded digital input words into associated analog signals, each input word including first, second and third code groups of one or more bits defining the polarity, prescribed segment, and step offset in the prescribed segment for an associated analog signal sample, respectively, said apparatus comprising:

first capacitor means having one and other sides thereof and having a net normalized capacitance C1=mCo, where m is an integer and Co is a normalized capacitance;

second capacitor means having one and other sides thereof and having a capacitance C2=nmCo, that is an integral multiple of the principal number n of steps within each segment;

third capacitor means having pluralities of one and other

sides thereof and having a total-net normalized capacitance which is substantially Cs=nmCo-mCo=(n-1)mCo;

first means for impressing one of a positive and negative prescribed reference voltage on a first bus line;

amplifier means having an input and an output terminal connected to one and other sides of said second capacitor means, said input terminal having a ground reference potential impressed thereon;

first switch means selectively operative for electrically connecting a second bus line to one of ground and said other side of said second capacitor means; and

second switch means responsive to the second and third code groups (a) for cyclically connecting said one and other sides of said first and third capacitor means to ground and said first bus line, respectively, for charging the associated capacitances with the one prescribed reference voltage, and then connecting said one and other sides of said first and third capacitor means simultaneously to said one side of said second capacitor means and said second bus line, respectively, for stabilizing charge on said capacitances a number of times (which may be zero) associated with a segment that is designated by the second code group; (b) for subsequently first connecting one and other sides of said first and third capacitor means to ground and to ones of said first bus line and ground, respectively, so as to impress a charge on capacitances that corresponds to the step offset (designated by a third code group) in the prescribed segment (designated by the second code group), and then simultaneously connecting one and other sides of said first and third capacitor means to said one side of said second capacitor means and said second bus line, respectively, for stabilizing charge on capacitances thereof; and (c) subsequently cyclically connecting both sides of said first and third capacitor means to ground and then connecting one and other sides of said first and third capacitor means to said one side of said second capacitor means and said second bus line, respectively, for redistributing charge on the connected capacitances a number of times corresponding to segments that are above the prescribed segment specified by the second code group and containing the step offset defined by the third code group;

said first switch means being operative for connections of one and other sides of said first and third capacitor means to the one side of said second capacitor means and said second bus line, respectively, that are associated with a first segment and with other segments for connecting said second bus line to ground and to the other side of said second capacitor means, respectively; said first and third capacitor means transferring charge thereon to said second capacitor means during a connection of said second bus line that is associated with the first segment, and redistributing charge on said capacitor means for other connections of said second bus line.

4,468,655

MULTIPLEX SECURITY SYSTEM USING REMOTE MICROPROCESSORS

Hideki Iwata, Portland, Oreg., assignor to Nel-Tech Development, Inc., Portland, Oreg.

Division of Ser. No. 244,121, Mar. 16, 1981, Pat. No. 4,392,125. This application Sep. 30, 1982, Ser. No. 429,040

Int. Cl.³ G08B *26/00*; H04Q *9/00*

U.S. Cl. 340—518 **10 Claims**

1. A security communications system comprising:

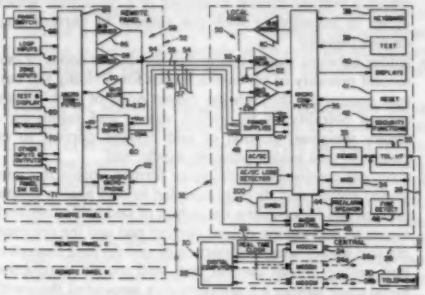
a local panel and a plurality of remote panels interconnected by a common bi-directional data line and a common bi-directional voice line;

remote speaker means and microphone means in each of the remote panels for receiving and transmitting audio signals via said voice line;

local speaker means in the local panel for receiving and reproducing sounds transmitted over said voice line; and

logic means in each of the remote and local panels connected to transmit and receive data signals via the data line, including a unique data signal from the remote panel to request enabling of the local speaker means;

the remote panel logic means being controllingly connected to the remote speaker means and microphone means;



the local panel logic means being controllingly connected to the local speaker means and responsive to receiving said unique data signal via the data line from the logic means of one of the remote panels for selectably enabling said local speaker means to output an audio signal transmitted over the voice line from the microphone means of said one of the remote panels.

4,468,656

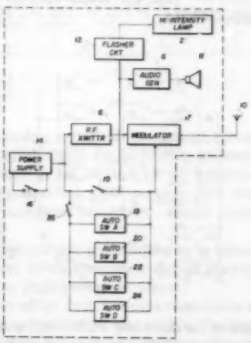
EMERGENCY SIGNALLING UNIT AND ALARM SYSTEM FOR RESCUING ENDANGERED WORKERS

Thomas J. Clifford, 6 Massachusetts Ave., Massapequa, N.Y. 11758, and Bernard L. Jansen, 529 Asharoken Ave., Northport, N.Y. 11768

Filed Jun. 24, 1981, Ser. No. 276,724

Int. Cl.³ G08B *1/08*

U.S. Cl. 340—539 **9 Claims**



1. An emergency signalling unit to be carried on the person of a fireman or other emergency worker to alert others should the life of the fireman or emergency worker become endangered and to aid in locating the fireman or worker in such a situation, said unit being capable of transmitting both a radio carrier signal by itself and a modulated carrier signal, comprising,

radio transmitter means for generating a radio carrier signal,

modulator means for generating a modulation signal for modulating said carrier signal,

high intensity lamp means for generating a visual emergency signal,

audio frequency signal source means for generating an audible emergency signal,

power supply means connected to said transmitter means, said modulator means, said lamp means and said audio frequency signal generator means,

first switch means connected between said power supply means and said transmitter means for switchably providing electrical power to said transmitter means to cause said transmitter means to generate said radio carrier signal,

second switch means connected between said power supply means and said modulator means, said lamp means and said audio frequency signal source means for switchably supplying power to said modulator means, said lamp means and said audio frequency signal source means to cause said modulation signal to be generated for modulating said carrier signal and to cause said lamp means and said audio frequency signal source means to provide visual and audible emergency signals respectively, and

housing means for containing said radio transmitter means, said modulator means, said lamp means, said audio frequency signal source means, and said power supply means, said housing means being adapted for being carrier by said fireman or other worker.

4,468,657

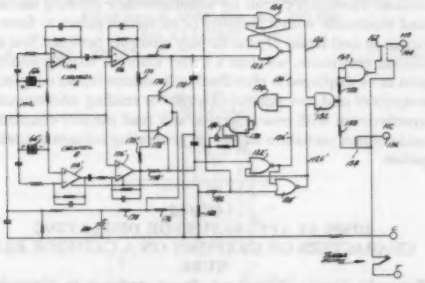
SIMPLIFIED INTRUDER DETECTOR

John A. Rossin, 1411 Norman Firestone Rd., Goleta, Calif. 93117

Continuation-in-part of Ser. No. 215,800, Dec. 12, 1980, , Ser. No. 192,067, Sep. 29, 1980, , Ser. No. 73,869, Sep. 10, 1979, , and Ser. No. 117,957, Feb. 4, 1980,. This application Mar. 25, 1981, Ser. No. 247,234

Int. Cl.³ G08B *13/18*

U.S. Cl. 340—555 **8 Claims**



1. An intruder detector having sensor means producing an electrical signal and responsive to an intruder, the sensor means including at least a pair of sensor elements viewing adjacent fields and responsive to the passage of an intruder between those fields to cause first one sensor then the other sensor of the pair to produce an electrical signal;

electronic means connected to the sensor means and responsive to the electrical signals produced by the pair of sensor elements to generate an alarm signal, the electronic means having two channel means, each channel means being connected to a corresponding one of the sensor elements and responsive to the electrical signals of that element to produce a first output signal;

alarm actuation means electrically responsive to a given intensity of a first output signal from one then the other of the two channel means, the first output signals being of an intensity at least equal to a given intensity, to generate an alarm signal; and inhibition means responsive to the first output signal of either channel to prevent response by the alarm actuation means to the substantially simultaneous generation of the first output signal of the other channel of an intensity less than said given intensity thereby to inhibit the generation of an alarm signal in response to substantially simultaneous generation of first output signals by the two channel means.

4,468,658

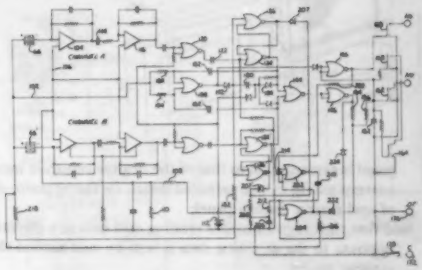
SIMPLIFIED INTRUDER DETECTION MODULE

John A. Rossin, 1411 Norman Firestone Rd., Goleta, Calif. 93017

Continuation-in-part of Ser. No. 192,067, Sep. 29, 1980, , and Ser. No. 117,957, Feb. 4, 1980, , and Ser. No. 73,869, Sep. 10, 1979,. This application Dec. 12, 1980, Ser. No. 215,800

Int. Cl.³ G08B *13/18*

U.S. Cl. 340—567 **21 Claims**



1. An intruder detection module having:

sensor means for producing an electric signal in response to non-visible radiation emitted by an intruder, the sensor means including at least one sensor pair having sensors substantially opaque to said non-visible radiation but substantially transparent to visible radiation;

optical means including a primary reflector for directing visible and non-visible radiation from a plurality of zones, both the visible and non-visible radiation from one zone being directed onto one sensor of the sensor pair, the visible and non-visible radiation from the second zone being directed onto the second sensor of the sensor pair;

means to direct radiation passing through one sensor to the other sensor of the pair, and

electronic means responsive to the electric signal output of the sensors to produce an alarm signal if one then the other sensor produces an output but to inhibit the alarm signal if both sensors produce an output at substantially the same time, whereby the system discriminates between radiation flashes simultaneously striking both sensors and movement of a non-visible radiation source across the zones defined by the optical means.

4,468,659

ELECTROLUMINESCENT DISPLAY PANEL ASSEMBLY

Toshihiro Ohba, Nara; Yoshiharu Kanatani, Tenri; Hiroshi Kinoshita, Tenri; Morihisa Sogabe, Tenri, and Yoshihide Fujioka, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1981, Ser. No. 294,245

Claims priority, application Japan, Aug. 23, 1980, 55-117365; Aug. 28, 1980, 55-119443; Aug. 28, 1980, 55-119444

Int. Cl.³ G09G *3/30*

U.S. Cl. 340—719 **15 Claims**

1. A matrix display panel circuit comprising:

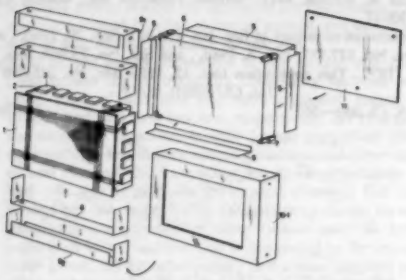
a matrix display panel having four sides;

driver means for driving the matrix display panel, the driver means comprising first and second bi-directional shift register means of like construction for selectively selectively sending data to said display panel in an alternating fashion;

terminal means of the matrix display panel connected to the

driver means, the terminal means being led out from at least two opposite sides of the display panel; and

flexible substrate means for supporting the driver means in such a manner that the configuration of said driver means on said flexible substrate means corresponding to one of said terminal means on one side of said matrix display



panel is symmetrical to that of the flexible substrate means corresponding to said terminal means on the opposite side of said matrix display panel;

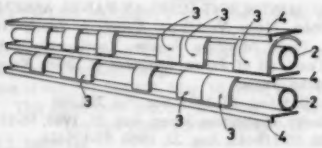
said first shift register means sending said data in a direction opposite to the direction data is sent by said second shift register means.

4,468,660

ELECTRIC LIGHT DISPLAY APPARATUS OF LIGHT BLOCKING TYPE

Shinya Ishida, Kashihara, and Masayoshi Miyata, Hirakata, both of Japan, assignors to Kinki Nippon Tetsudo Kabushiki Kaisha and Kinki Sharyo Kabushiki Kaisha, both of Osaka, Japan

Filed Dec. 14, 1981, Ser. No. 330,250
Claims priority, application Japan, Dec. 24, 1980, 55-184890
Int. Cl.³ G09F 9/00
U.S. Cl. 340—764 11 Claims



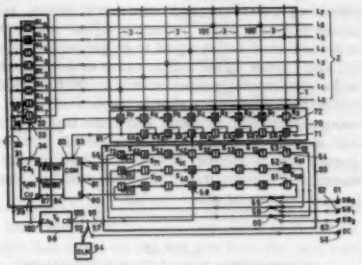
1. An electric light display apparatus of the blocking type comprising a transparent front plate, tubular light sources arranged in a plurality of rows in parallel immediately behind said front plate, each source divided into a plurality of unit sections arranged continuously longitudinally thereof, and a light blocking member provided for each of the unit sections and operable by electromagnetic means and mechanical means for shielding and exposing the unit section.

4,468,661

MATRIX EXCITATION CIRCUIT FOR AN OSCILLOSCOPE DISPLAY SCREEN COMPRISING A LIQUID CRYSTAL

Cornelis Z. Van Doorn, and Jean H. J. Lorteije, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 71,828
Claims priority, application Netherlands, Sep. 6, 1978, 7809081
Int. Cl.³ G09G 3/36
U.S. Cl. 340—784 15 Claims



1. A matrix excitation circuit for an oscilloscope display screen comprising a root-mean-square type of liquid crystal, a plurality of first line-shaped electrodes extending in a first direction at one side of said liquid crystal, a plurality of second line-shaped electrodes extending in a second direction at an opposite side of said liquid crystal, said first direction crossing said second direction, a row selection circuit for sequentially and cyclically exciting each of said first electrodes, and a column excitation circuit for simultaneously exciting said second electrodes with a plurality of excitation pulses to form an image in said liquid crystal display elements between first and second electrodes, wherein a buffer store for storing information to be displayed is provided with address inputs coupled to outputs of said row selection circuit for reading information in synchronism with row selection and read outputs coupled to said column excitation circuit for generating column excitation pulses.

4,468,662

DISPLAY APPARATUS FOR DISPLAYING CHARACTERS OR GRAPHICS ON A CATHODE RAY TUBE

Kazuyuki Tanaka, Kamakura, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 17, 1981, Ser. No. 331,871
Claims priority, application Japan, Dec. 24, 1980, 55-184283
Int. Cl.³ G09G 1/00
U.S. Cl. 340—789 2 Claims

1. A display apparatus for displaying characters or graphics on a cathode ray tube comprising:

a picture memory having memorizing portions which correspond in a one-to-one relation with characters or graphics to be displayed on the screen of the cathode ray tube;

a cathode ray tube controller for supplying a display address to the memory for addressing the memory associated with each of said memorizing portions;

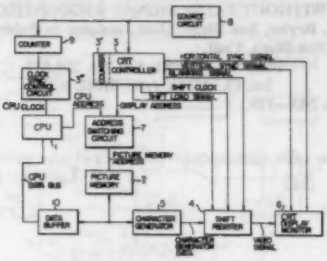
a CPU for supplying a CPU address to the memory for addressing the memory in order to control reading and writing of said picture memory;

an address switching circuit for passing either of said display address or said CPU address to said picture memory under the control of a picture display switching signal;

a source oscillator for generating an oscillation output signal and for supplying it to the cathode ray tube controller;

a first counter for counting the oscillation output signal in order to generate a first CPU clock signal;

a second counter for counting the oscillation output signal in order to generate a second CPU clock signal, the frequency of said second CPU clock signal being higher than the frequency of said first CPU clock signal; and,



a clock synchronizing control circuit for controlling and selecting one of said first and second CPU clock signals to be applied to the CPU in response to a picture memory selecting signal so that the first CPU clock signal is applied as a clocking signal to the CPU during the period when said CPU is reading to or writing from said picture memory, and the second CPU clock signal is applied as a clocking signal to the CPU during other periods.

4,468,663

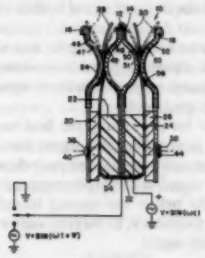
ELECTROMECHANICAL REFLECTIVE DISPLAY DEVICE

Charles G. Kalt, 29 Hawthorne Rd., Williamstown, Mass. 01267

Filed Sep. 8, 1981, Ser. No. 299,804

Int. Cl.³ G02F 1/16

U.S. Cl. 340—815.27 **12 Claims**



1. An electrostatically driven electromechanical display device, comprising:

(a) first electrode means having a reflective face of first reflectivity;

(b) second electrode means having a reflective face of second reflectivity, said second reflectivity being different from said first reflectivity;

(c) a flexible conductive tongue disposed between said first and second electrode means;

(d) first support means for supporting said first electrode means with its face in facing spaced relationship to the face of said second electrode means; and

(e) second support means for supporting said tongue between said facing portions of said first electrode means and second electrode means in a position from which said tongue may be caused to bear against the face of said first electrode means or the face of said second electrode means and in which said tongue is in contact with the base portions of the reflective faces of said first electrode means and said second electrode means.

4,468,664

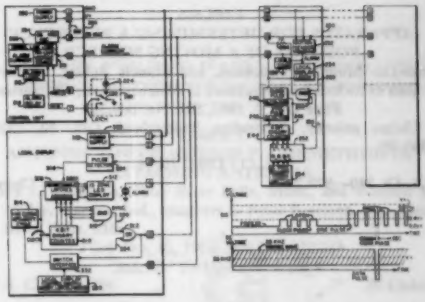
NON-HOME RUN ZONING SYSTEM

Aaron A. Galvin, Lexington; John K. Guscott, Lynnfield; Martin E. Henderson, Wayland, and Roy L. Harvey, Lexington, all of Mass., assignors to American District Telegraph Company, New York, N.Y.

Continuation of Ser. No. 151,969, May 21, 1980, abandoned. This application Jan. 12, 1982, Ser. No. 338,839

Int. Cl.³ G08C 19/00; G08B 1/00

U.S. Cl. 340—825.69 **24 Claims**



24. In a zone indication system having a multiwire transmission line and a control unit which transmits clock pulses over one wire of said multiwire transmission line to at least one remote unit having data corresponding to the status thereof, said remote unit comprising:

at least one counter receiving said clock pulses in the form of DC voltage pulses from said one wire and being incremented thereby, and providing a corresponding output signal; and

means for receiving said counter output signal and for transmitting said data in the form of current pulses when said counter output signal reaches a predetermined count, said current pulses being applied to said one wire.

4,468,665

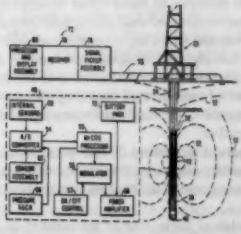
DOWNHOLE DIGITAL POWER AMPLIFIER FOR A MEASUREMENTS-WHILE-DRILLING TELEMETRY SYSTEM

S. Tom Thawley, and Craig M. Scott, both of Dallas, Tex., assignors to Tele-Drill, Inc., Richardson, Tex.

Filed Jan. 30, 1981, Ser. No. 229,799

Int. Cl.³ G01V 1/40

U.S. Cl. 340—856 **18 Claims**



1. A downhole digital power amplifier for use in downhole

telemetry applications, wherein the downhole digital power amplifier has the capability of selecting frequency, power and modulation modes, said downhole digital power amplifier comprising:

digital input means for selecting at least one of frequency and power, and for additionally selecting a modulation mode of the downhole digital power amplifier;

generating means for generating a sinusoidal output characterized by said selected at least one of said frequency and power, and modulated in accordance with said selected modulation mode; and

transmitting means for transmitting said generated sinusoidal output from the downhole digital power amplifier through the earth to the earth's surface.

4,468,666

APPARATUS FOR DETERMINING A REFERENCE POSITION OF A MOVING MEMBER

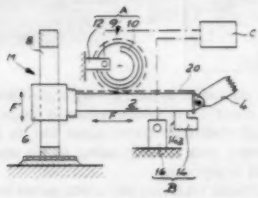
Jean-Luc Monnier, Neuchatel, and Francis Robert, Chezard, both of Switzerland, assignors to Microbo, S.A., Switzerland

Filed Oct. 7, 1981, Ser. No. 309,263

Claims priority, application Switzerland, Oct. 10, 1980, 7569/80

Int. Cl.³ G08C *19/16*

U.S. Cl. 340—870.29 **4 Claims**



1. Apparatus for determining a reference position for a movable member to enable the displacement of the movable member from the reference position to be measured comprising

(a) an elongated movable member adapted for translational movement in a forward or reverse direction,

(b) a first position-determining unit in driven engagement with said movable member, the first positioning-determining unit comprising a first rotatable member having a first marking element, the translational movement of said movable member imparting to said first rotatable member a rotary movement corresponding to the translational movement of said movable member, and a first detecting device for producing a first electrical signal representing the instant when said first marking element passes in front of said first detecting device,

(c) a second position-determining unit mounted to respond to the translational movement of said elongated movable member, the second position-determining unit comprising a second marking element and a second detecting device movable relative to each other in response to the translational movement of said elongated movable member, one of said second marking element and said second detecting device having translational movement corresponding to the translational movement of said movable member and the other of said second marking element and said second detecting device being stationary in relation to said movable member,

(d) said second detecting device producing a second electrical signal representing the instant when said second marking element passes in front of said second detecting device, and

(e) an electrical logic circuit connected to receive said first and second position electrical signals to produce a signal representative of the instant when one of said marking elements passes its detecting device after the other marking element has passed its detecting device to thereby indicate passage of the elongated movable member through the reference position.

4,468,667

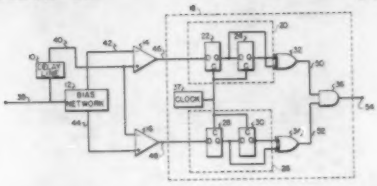
DETECTION OF AN IDENTIFICATION SIGNAL CONTAINED WITHIN A COMPOSITE SIGNAL, WITHOUT FALSE SIGNAL RECOGNITION

John T. Baylor, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Sep. 2, 1981, Ser. No. 298,877

Int. Cl.³ H04K *1/06*; H04L *9/00*

U.S. Cl. 343—379 **3 Claims**



1. A system for detecting the presence in a composite signal of an identification signal having a predetermined frequency, comprising

delay means for delaying the composite signal by one-half the cycle of the identification signal as defined by the predetermined frequency to thereby provide a delayed signal;

means for biasing the composite signal to provide a first biased signal that is biased a predetermined differential above the composite signal, and to provide a second biased signal that is biased the predetermined differential below the composite signal;

a first comparator for comparing the first biased signal to the delayed signal to provide a first comparison signal that indicates when the delayed signal is above the first biased signal;

a second comparator for comparing the second biased signal to the delayed signal to provide a second comparison signal that indicates when the delayed signal is below the second biased signal; and

a signal processor for processing the first and second comparison signals to provide a flag signal that indicates when the delayed composite signal both periodically rises above the first biased signal at the predetermined frequency and periodically falls below the second biased signal at the predetermined frequency, to thereby indicate detection of the identification signal.

4,468,668

METHOD FOR PROCESSING SIGNALS IN A NAVIGATION RECEIVER

Lester R. Brodeur, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 3, 1981, Ser. No. 289,842

Int. Cl.³ G01S *1/24*

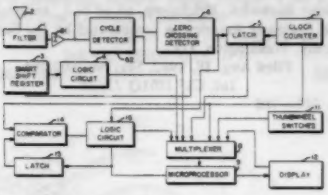
U.S. Cl. 343—389 **7 Claims**

1. A method for processing signals periodically received and tracked by a receiver which predetermines the time when each subsequent signal is to be received to aid in the detection and tracking of the received signals, comprising the steps of:

measuring the ratio of signal-to-noise of said received periodic signals, and

modifying the actual time of signal reception at said receiver of each periodic signal to get a modified time of signal reception that is closer in time to the corresponding predetermined time of signal reception thereby decreasing the time deviation caused by noise that is actually erroneous,

the degree of time modification being dependent upon said signal-to-noise ratio, said modified times of signal reception being used by said receiver to provide more accurate signal tracking.

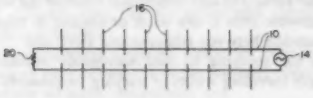


4,468,669

SELF CONTAINED ANTENNA TEST DEVICE

Shil-Shyong Wang, and Ruey-Shi Chu, both of Cerritos, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 10, 1982, Ser. No. 387,098
Int. Cl.³ G01R *29/08*
U.S. Cl. 343—703 **8 Claims**



1. A system for testing antennas comprising:
a planar array of dipole radiating elements;
a plurality of twin lead transmission lines disposed normal to said planar array in a closely spaced electromagnetic mutual coupling relationship, each transmission line crossing a linear array of said dipoles and being in a common plane with the other transmission lines;
a near field source of radio frequency signal;
means for applying said signal equally to said plurality of transmission lines; and
means for automatically extracting and processing signals from selected portions of said planar array to test and measure characteristics of said array.

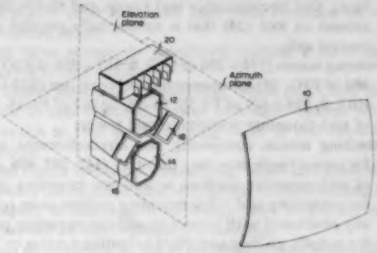
4,468,670

ANTENNA DEVICE FOR AIR TRAFFIC RADAR

Yasuo Suzuki, Tokyo, and Taneaki Chiba, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 21, 1982, Ser. No. 341,585
Claims priority, application Japan, Jan. 29, 1981, 56-12096
Int. Cl.³ H01Q *19/12, 25/00*
U.S. Cl. 343—727 **13 Claims**

1. An antenna device comprising:
a reflector;
a first primary radiator including a low beam antenna disposed substantially at the focal point of said reflector and a high beam antenna adjacent one side of said low beam antenna; and
a second primary radiator including a first antenna in the azimuth plane between said low and high beam antennas, at least a part of said first antenna being in a region between elevation planes each contacting a different opposing side of said high and low beam antennas, and a second antenna disposed on the side of said low beam antenna opposite said high beam antenna and arranged so that the equivalent phase center of said second primary radiator substantially coincides with that of said low beam antenna.

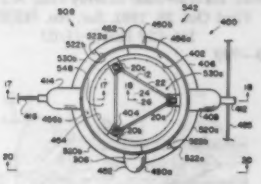


4,468,671

ANTENNA TOWER ASSEMBLY AND METHOD OF ATTACHING ANTENNAS

Gary L. Ellingson, Thief River Falls, Minn., and Wendell E. Miller, Warsaw, Ind., assignors to Polar Research, Inc., Thief River Falls, Minn.

Filed Jun. 10, 1981, Ser. No. 272,313
Int. Cl.³ H01Q *1/12, 3/04*
U.S. Cl. 343—766 **30 Claims**



1. A tower and rotationally positionable mount assembly (**538**, **540**, **542**, or **544**) which comprises a tower (**12**) having a neutral axis (**26**);
a first mounting portion (**170**+**204** of FIG. **8**, **328**+**342** of FIGS. **14–15**, or **406** or **418** of FIG. **18**);
a first segment (**512***a*, **516***a*, or **456***a*) having a first arcuate surface (**524***a*, **524***b*, **526***a*, **526***b*, **528***a*, or **528***b*), and having a first opening (**530***a*) that is disposed radially inward of said first arcuate surface and that opens radially outward from said first segment distal from said first arcuate surface;
a second segment (**512***b*, **516***b*, or **456***b*) having a second arcuate surface (**524***a*, **524***b*, **526***a*, **526***b*, **528***a*, or **528***b*), and having a second opening (**530***b*) that is disposed radially inward of said second arcuate surface and that opens radially outward from said second segment distal from said second arcuate surface;
a second mounting portion (**142** of FIG. **8**, **292** of FIG. **14**, or **402** of FIG. **18**), being disposed circumferentially around

said tower, and having a circumferential surface (**152** or **154** of FIG. **12**, **302** or **304** of FIGS. **14–15**, or **432** or **434** of FIGS. **17–18**) that includes both of said arcuate surfaces, that circumscribes said tower, and that is disposed around an axis (**24**) that is substantially parallel to said neutral axis;

securing means (**174**+**206** of FIG. **8**, **352**+**354** of FIG. **14**, or **404** of FIG. **18**) for operatively securing one (**170**+**204** of FIG. **8**, **328**+**342** of FIGS. **14–15**, or **402** of FIGS. **17–18**) of said mounting portions to said tower;

attaching means, comprising said circumferential surface, for supportingly attaching the other (**142**, **292**, **406**, or **418**) of said mounting portions to said one mounting portion, for permitting said other mounting portion to be rotationally positioned with respect to said one mounting portion, for radially guiding said other mounting portion by operative contact of said circumferential surface with said first mounting portion, and for vertically restraining said other mounting portion; and

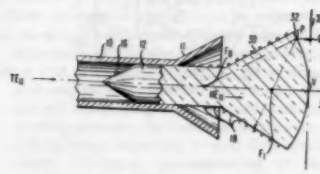
means (**214**+**222**+**158** of FIGS. **8** and **11**, **214**+**186**+**152** or **154** of FIGS. **8**, **11**, and **13**, or **360**+**372**+**370** of FIGS. **14** or **18**) for rotationally positioning said other mounting portion with respect to said one mounting portion.

4,468,672

WIDE BANDWIDTH HYBRID MODE FEEDS

Corrado Dragone, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1981, Ser. No. 315,670
Int. Cl.³ H01Q *13/02*
U.S. Cl. 343—783 **7 Claims**



1. A hybrid mode feed arrangement comprising:

a smooth-walled feedhorn comprising a hollow conductive waveguide section (**10**) for propagating the TE_{11} mode introduced at an entrance of the feedhorn and an outwardly flared conductive end section (**11**) at an aperture of the feedhorn, both the hollow waveguide and flared end sections including an inner (**15**) and an outer longitudinal wall surface; and

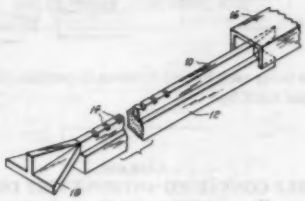
a rod (**12**) of dielectric material comprising a first end section including an outer wall which symmetrically engages a longitudinal portion (**14**) of the inner surface of the hollow waveguide section for intercepting the TE_{11} mode propagating in said hollow waveguide section and further extends through the flared end section and beyond the aperture of the feedhorn in a non-contacting arrangement for converting the TE_{11} mode into the HE_{11} mode and propagating the HE_{11} mode therein, and a second end section protruding beyond the aperture of the feedhorn comprising an outwardly tapered horn (**30**) including a curved aperture at the wide end thereof for launching the HE_{11} mode.

4,468,673

FREQUENCY SCAN ANTENNA UTILIZING SUPPORTED DIELECTRIC WAVEGUIDE

Richard A. Stern, Allenwood; Richard W. Babbitt, Fairhaven, and John Borowick, Bricktown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1982, Ser. No. 409,201
Int. Cl.³ H01Q *13/28*
U.S. Cl. 343—785 **6 Claims**



1. A dielectric waveguide frequency scan antenna comprising:

a longitudinally extending dielectric waveguide having a rectangular cross-section;

a plurality of periodically spaced transverse slots in the upper surface of said waveguide wherein the width of said transverse slots is one tenth or smaller in relation to the separation between adjacent said slots; and

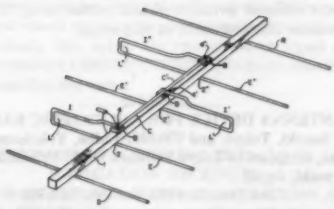
means for applying to said waveguide millimeter wavelength traveling waves of varying frequencies.

4,468,674

ASSYMETRICAL FOLDED HALF-DIPOLE AND LINEAR EXTENSION ANTENNA ARRAY

Isaac S. Blonder, Morganville, N.J., assignor to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Jul. 22, 1982, Ser. No. 400,978
Int. Cl.³ H01Q *21/08*
U.S. Cl. 343—815 **6 Claims**

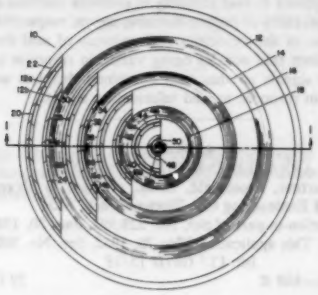


1. A linear antenna array comprising a conductive boom extending along a longitudinal line, a plurality of transversely extending antennas mounted at longitudinally spaced locations along the boom and each having a folded antenna loop disposed on one side of the boom with one free end of the loop connected to the boom and a conductive extension therefrom disposed on the opposite side of the boom, and with the other free end of the loop terminating at a point spaced laterally of the boom; conductive strap means extending laterally substantially parallel to the boom and connecting the said other free ends of successive antenna loops; and the loops of successive antennas being disposed on opposite sides of the boom.

4,468,675
SHORTENED ANTENNA WITH COAXIAL TELESCOPING CYLINDERS

Lawrence P. Robinson, Mobile Home Manor, 2756 E. Grand River Ave., East Lansing, Mich. 48823

Filed Nov. 4, 1981, Ser. No. 318,011
Int. Cl.³ H01Q 9/14, 1/10
U.S. Cl. 343—828 16 Claims



1. An antenna comprising:

a plurality of axially extending, radially spaced apart, elongated electrical conductors each having a circumferential extent different than the circumferential extent of the adjacent conductors;

electrically conductive coupling means for coupling opposite ends of each conductor to the adjacent opposite ends of alternate adjacent conductors; and

electrically conductive, short circuiting means removably mounted on adjacent ones of selected adjacent conductors;

said coupling means including a plurality of antenna section means telescopingly, slidingly mounted on said conductors for movement between any selected one of a plurality of different positions to selectively increase or decrease the current conducting path of said conductors;

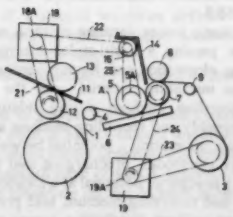
said elongated conductors comprising a plurality of coaxial cylinders;

said coupling means comprising antenna section means telescopingly mounted on adjacent ones of selected cylinders.

4,468,676
TRANSFER TYPE HEAT-SENSITIVE PRINTER

Hisao Nakajima; Yoshiki Kikuchi, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,544
Claims priority, application Japan, Jul. 17, 1981, 56-110770
Int. Cl.³ G01D 15/24; B65H 7/00
U.S. Cl. 346—76 PH 6 Claims



1. A transfer type heat-sensitive printer, comprising;

a recording secion for recording data on a recording sheet by thermal transfer;

separating means for separating said recording sheet from an ink donor sheet after data have been recorded on said recording sheet;

a first drive source for selectively turning a drive shaft thereof in two directions;

first clutch means for transmitting, when said drive shaft turns in one direction, power to a drive system which operates to feed said recording sheet to said recording section;

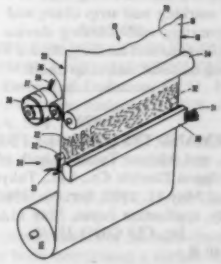
second clutch means for transmitting, when said drive shaft turns in the opposite direction, power to a discharging roll adapted to discharge a recording sheet which has been separated by said separating means; and

second drive source for successively supplying an elongated ink donor sheet to said recording section and for halting the supply of said sheet when the rear end of said recording sheet is separated from said ink donor sheet.

4,468,677
PRINTING APPARATUS

Arnold Schonfeld, Norristown, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,775
Int. Cl.³ G01D 9/42; H05B 1/00
U.S. Cl. 346—107 R 7 Claims



1. A printing apparatus comprising:

means for retaining a substantially continuous supply of printing medium, said medium being of a construction sufficient to be light sensitive and heat developed, said printing medium having opposed surfaces, one of said surfaces including a conductive-resistant coating formed in a plurality of strips;

a print processing station;

means for moving said medium from said retainer past said station;

means operable for printing by exposing said moving medium to an image produced by an array of light emitting elements and

means operable for incrementally developing said strips of said medium in response to operation of said light emitting elements for fixing said image on said medium, said means for developing including a pair of electrical contacts urged into engagement with said medium.

4,468,678

SYSTEM FOR CONTROLLING A STRIP CHART RECORDER

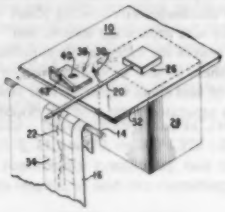
Patrick G. Phillipps, Cheshire, and William G. Fairchild, Wallingford, both of Conn., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 229,237, Jan. 28, 1981, Pat. No. 4,396,922. This application Dec. 3, 1982, Ser. No. 446,750

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.³ G01D *15/24*

U.S. Cl. 346—139 R **4 Claims**



1. A system for making a trend record of time dependent data on a recording scale of a strip chart comprising:

recording means which include a marking device operable for travelling over and beyond the recording scale of the strip chart in response to an input signal supplied to said marking device;

means for drawing the strip chart past the recording means;

means for selecting between said time dependent data and a further signal in response to a control signal which is indicative of the reliability of said time dependent data and supplying said selected signal as said input signal to said marking device such that said marking device in response to said further signal as said input signal rapidly travels over and beyond the recording scale of said strip chart so as to avoid marking said strip chart; and

means for separating said marking device from said strip chart in response to said marking device travelling beyond the recording scale of said strip chart.

4,468,679

ON-DEMAND TYPE INK-JET PRINTER

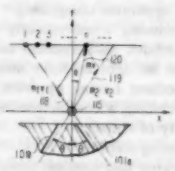
Michihisa Suga, and Mitsuo Tsuzuki, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 376,997

Claims priority, application Japan, May 11, 1981, 56-70465

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **11 Claims**



1. An ink-jet printer for recording an information by jetting ink droplets on a recording medium, said printer comprising:

a print head including a plurality of droplet-forming means for jetting said ink droplets onto said recording medium, each of said droplet-forming means having a pressure chamber filled with ink, pressure-exertion means for exerting a pressure on said ink filled in said pressure chamber in response to a driving signal, and a nozzle for jetting said ink droplets, the nozzles in said plurality of said droplet forming means being arranged so that said ink droplets jetted from said nozzles are combined with each other to produce combined droplets at a space between said nozzles and said recording medium, said combined droplets being applied onto said recording medium; and

print head driving means for producing a plurality of said driving signals in response to information signals representative of said information, said plurality of driving signals being applied to said plurality of pressure exertion means in said plurality of droplet-forming means, respectively, at least one of the velocities and volumes of said droplets jetted from said nozzles being varied in response to said driving signals so that said combined droplets are deflected in response to said information signals.

4,468,680

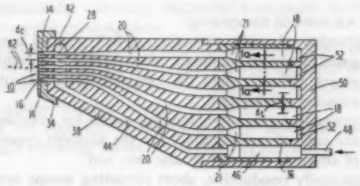
ARRAYED INK JET APPARATUS

John G. Martner, Brookfield, Conn., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 229,992, Jan. 30, 1981, abandoned. This application May 20, 1982, Ser. No. 380,080

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **39 Claims**



1. A drop-on-demand ink jet apparatus comprising:

an ink jet chamber including an inlet port for receiving ink in said chamber and an outlet orifice for ejecting ink droplets from said chamber;

a transducer remotely located from said chamber; and

an acoustic waveguide coupled between said ink jet chamber and one end of said transducer for transmitting individual acoustic pulses generated at said transducer to said chamber for changing the volume of said chamber in response to the state of energization of said transducer, said inlet port comprising a hole in said waveguide for coupling ink from a reservoir to said chamber via a passageway included in said waveguide.

4,468,681

ELECTROSTATIC RECORD IMAGE FORMING METHOD

Shoji Wako, and Hidemasa Todo, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,566

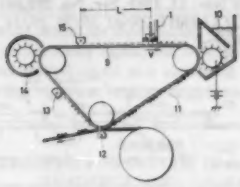
Claims priority, application Japan, Jan. 27, 1981, 56-10643

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—153.1 **4 Claims**

1. An electrostatic image forming method comprising the following steps: passing a multi-stylus electrode assembly, having charging electrodes and having auxiliary electrodes covered with an insulating material, over the surface of an electrostatic recording medium during relative movement between said assembly and recording medium at an electrode assembly location, generating a potential between said charging and auxiliary electrodes, precharging said recording medium surface to a precharge potential at a location prior to said assembly along said recording medium, said precharge potential having a non-uniform distribution across said recording medium varying by at least approximately 50%, and controlling the distance L between said precharging location and said

electrode assembly location and the speed v of relative movement of said assembly and recording medium for reducing the



voltage differential of said preliminary charge across said recording medium surface at said electrode assembly location to approximately 20%.

4,468,682

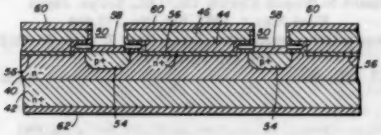
SELF-ALIGNED HIGH-FREQUENCY STATIC INDUCTION TRANSISTOR

Adrian I. Cogan, Waltham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 12, 1981, Ser. No. 320,240

Int. Cl.³ H01L *29/80, 29/06, 29/04*

U.S. Cl. 357—22 **1 Claim**



1. A vertical geometry static induction transistor comprised of:

a substrate of highly doped n-type single crystal silicon;

a metal drain electrode on one side of said substrate;

an epitaxial layer of high resistivity n-type silicon on the opposite side of said substrate;

a plurality of T-shaped structures of n-type polycrystalline silicon on said epitaxial layer, said T-shaped structures having wider portion on the top and a narrower portion on the bottom adjacent to said epitaxial layer;

a plurality of T-shaped windows defined by adjacent T-shaped structures; said T-shaped windows wider on the bottom than at the top;

a layer of silicon dioxide on the sides of said T-shaped windows;

a gate region of p-type silicon in said epitaxial layer at the bottom of each of said T-shaped windows;

a source region of highly doped n-type silicon in said epitaxial layer beneath each of said T-shaped structures;

a metal gate electrode on top of each of said gate regions; and

a metal source electrode on top of each of said T-shaped structures.

4,468,683

HIGH POWER FIELD EFFECT TRANSISTOR

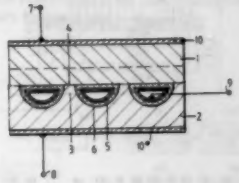
Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Higratherm Electric GmbH, Heilbronn, Fed. Rep. of Germany

Filed Jul. 1, 1980, Ser. No. 165,111

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1979, 2926741

Int. Cl.³ H01L *29/78, 29/80, 29/06*

U.S. Cl. 357—23 **9 Claims**



1. A field effect transistor comprising in combination: first and second semiconductor discs of the same type of conductivity, each of said discs having a plurality of parallel grooves formed in one major surface to define a structure of parallel ridges on each said disc; said first and second discs are oriented so that their structured surfaces face one another with said ridges of both said discs crossing and touching, and are permanently joined together at the areas of contact of said ridges to form a plurality of electrically parallelly connected monocrystalline narrow path resistors between said first and second discs; a gate means provided on said one major surface of at least one of said first and second discs for each said narrow path resistor; a non-blocking source electrode disposed on the opposite major surface of one of said first and second discs; and a non-blocking drain electrode disposed on the opposite major surface of the other of said first and second discs.

4,468,684

HIGH-DENSITY CHARGE-COUPLED DEVICES WITH COMPLEMENTARY ADJACENT CHANNELS

Leonard J. M. Esser, and Ludovicus G. M. Heldens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1982, Ser. No. 365,709

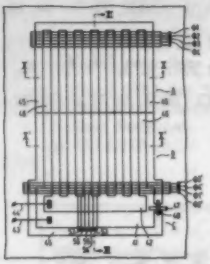
Claims priority, application Netherlands, Apr. 16, 1981, 8101883

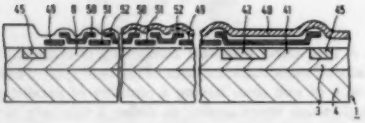
Int. Cl.³ H01L *29/78, 27/14, 31/00;* **G11C** *19/28*

U.S. Cl. 357—24 **9 Claims**

1. A charge-coupled device of the bulk-channel type having a semiconductor body comprising a surface-adjoining surface layer of the first conductivity type in which a number of mutually similar surface zones of the second conductivity type are provided which extend parallel to each other in the surface layer and, together with the intermediate, surface-adjoining parts of the surface layer, define a group of parallel and juxtaposed CCD-lines of alternately the first and the second conductivity type, characerterized in that the outputs of said CCD-lines of the first and the second conductivity types, respectively, are connected to parallel inputs of a series register of the first conductivity type and to the parallel inputs of a series register of the second conductivity type, respectively, said series registers being formed by CCD-lines of the bulk-channel type, the series register of the second conductivity type being defined by a further surface zone of the second conductivity type which is provided in the surface layer and which is present between the group of parallel CCD-lines, the series register of the first conductivity type being defined by a part of the surface layer which is present beside the series register of the second type, and means being provided for

forming underpasses below the series register of the second conductivity type via which charge packets can be transferred





from the group of parallel CCD-lines of the first conductivity type to the series register of the first conductivity type.

4,468,685

INFRARED DETECTOR USING GREY TIN

Robin F. C. Farrow, Hill Mount, 190 Wells Rd., Malvern Wells, Worcestershire, and Daniel S. Robertson, 205 Pickersleigh Rd., Malvern, Worcestershire, both of England

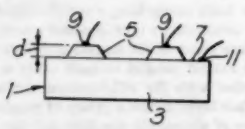
PCT No. PCT/GB81/00057, § 371 Date Nov. 19, 1981, § 102(e) Date Nov. 19, 1981, PCT Pub. No. WO81/02811, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 26, 1981, Ser. No. 325,431

Claims priority, application United Kingdom, Mar. 27, 1981, 8009588

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **8 Claims**



1. A semiconductor device, comprising:

a monocrystalline substrate; and

a monocrystalline region of semiconductor material in intimate contact with said substrate, said region of semiconductor material being grey tin stable over a range of temperature in excess of the bulk transition temperature between grey tin and white tin, the substrate being a material with a crystallographic structure isomorphus with the structure of grey tin, with an interatomic spacing matched within a tolerance of ±17% to the interatomic spacing of said semiconductor material over said range of temperature.

4,468,686

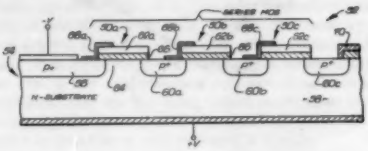
FIELD TERMINATING STRUCTURE

Bruce Rosenthal, Sunnyvale, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Nov. 13, 1981, Ser. No. 289,061

Int. Cl.³ H01L *29/40, 29/78, 29/34*

U.S. Cl. 357—53 **11 Claims**



1. In a semiconductor device having a p-n junction between a p-region and an n-region of a semiconductor material, and a contact for applying a reverse bias voltage across the p-n junction, a field terminating structure for reducing the electric field generated at the junction comprising:

a field-effect transistor having a predetermined threshold voltage, said transistor including a source region formed within one of the p or n regions and having the same conductivity type as the other of the p or n regions a drain region defined by said other of the p or n regions, and a gate electrode insulatively disposed over said one of the p or n regions and extending from the source region to said other of the p or n regions and operably connected to the drain region, wherein a reverse biasing voltage applied across the p-n junction, which exceeds the transistor threshold voltage, turns the transistor on, thereby decreasing the intensity of the electric field at the p-n junction and increasing the breakdown voltage of the junction.

4,468,687

TELEVISION SYNCHRONIZING SIGNAL REPRODUCING APPARATUS

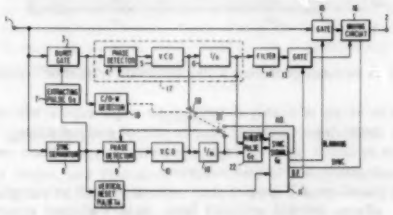
Kazushi Munezawa, and Toshihiko Tsuru, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 6, 1982, Ser. No. 375,604

Claims priority, application Japan, May 7, 1981, 56-68581

Int. Cl.³ H04N *9/46*

U.S. Cl. 358—19 **8 Claims**



1. A television synchronizing signal reproducing apparatus for reproducing at least one synchronizing signal from an input composite television video signal having at least a horizontal synchronizing signal and a burst signal having a subcarrier frequency, said apparatus comprising:

means receiving said input composite television signal for separating said horizontal synchronizing signal and burst signal from said input composite television video signal;

first producing means receiving said separated horizontal synchronizing signal for producing a first signal having the same frequency as said horizontal synchronizing signal and synchronized with said separated horizontal synchronizing signal;

second producing means for producing a second signal

having a frequency n times said subcarrier frequency and synchronized with said separated burst signal;

means responsive to said reproduced subcarrier signal and said first signal for generating a horizontal reset pulse synchronized to said reproduced subcarrier signal; and

reproducing means for reproducing said at least one television synchronizing signal, said reproducing means receiving said second signal as a clock and the output of said extracting means as said horizontal reset pulse.

4,468,688

CONTROLLER FOR SYSTEM FOR SPATIALLY TRANSFORMING IMAGES

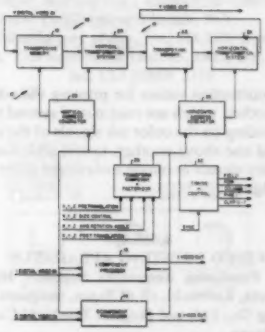
Steven A. Gabriel, Sunnyvale, and Michael A. Ogrinc, Mountain View, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

PCT No. PCT/US81/00470, § 371 Date Sep. 28, 1981, § 102(e) Date Sep. 28, 1981, PCT Pub. No. WO82/03712, PCT Pub. Date Oct. 28, 1982

PCT Filed Apr. 10, 1981, Ser. No. 310,902

Int. Cl.³ H04N 9/535

U.S. Cl. 358—22 **24 Claims**



1. An image processing system control system comprising:

a control panel including a joystick having three independent axes of movement and a plurality of keys receiving operator commands defining image manipulation parameters to which the three axes of the joystick pertain and desired operating states for an image processing system;

a panel processor coupled to the three axes of the joystick and to the plurality of keys, the panel processor being responsive to the status of the joystick and the keys to generate panel data defining the status thereof;

a high level controller including a programmable processor, the controller being coupled to receive the panel data, store parameters defining commanded image transformations at a plurality of knots in response to the panel data, and in response to the stored parameters generate for each field time a plurality of parameters commanding a transformation of an image being processed.

4,468,689

COLOR SEPARATION CIRCUIT

Yoshitake Nagashima, Chigasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 3, 1982, Ser. No. 414,910

Claims priority, application Japan, Oct. 8, 1981, 56-160511

Int. Cl.³ H04N 9/535

U.S. Cl. 358—31 **7 Claims**

1. A color separation circuit comprising:

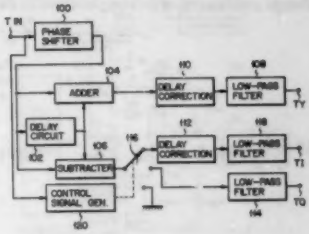
delay means for delaying a composite input video signal of NTSC system by one horizontal scanning time period;

an adder circuit for obtaining a sum of the output signal of said delay means and the input composite video signal;

a subtracter circuit for obtaining a difference between the output signal of said delay means and the composite input video signal;

clock signal generating means;

a demultiplexer circuit responsive to a clock signal from the clock signal generating means to perform a sampling operation for the output signal of said subtracter circuit at timings with phase difference of 90° of a chrominance signal contained therein to generate first and second sampled signals representing EI- and EQ-chrominance signal components respectively;



a first filter circuit for receiving the first sampled signal to derive the EI-chrominance signal component;

a second filter circuit for receiving the second sampled signal to derive the EQ-chrominance signal;

a third filter circuit for separating an EY-luminance signal component from the output signal of said adder circuit to draw out the same; and

delay correction means connected to said first and third filter circuits to correct the difference in phase delay between the output signals of said first to third filter circuits.

4,468,690

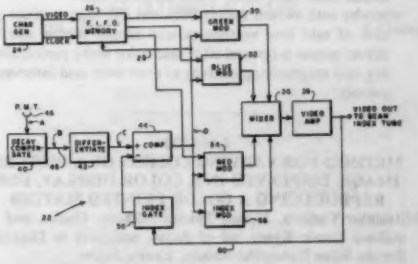
BEAM INDEX COLOR DISPLAY SYSTEM

Richard W. Midland, Inverness, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 270,944, Jun. 5, 1981, Pat. No. 4,408,223. This application Jun. 15, 1983, Ser. No. 504,650

Int. Cl.³ H04N 9/22, 9/24

U.S. Cl. 358—67 **8 Claims**



1. In a system having a beam index tube which generates a periodic index signal as the tube's beam strikes index strips within the tube, a display system for driving the tube with video data comprising:

means responsive to the index signal for generating an index clock signal;

means for supplying said video data to said tube in response to said index clock signal; and

gate means responsive to supplying of said video data to said tube coupled to said index clock signal generating means for inhibiting generation of the index clock signal.

4,468,691

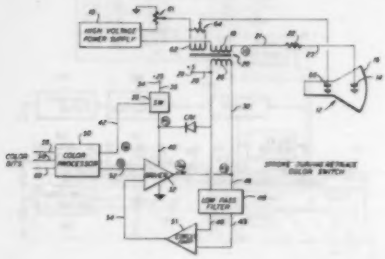
STROKE DURING RETRACE COLOR SWITCH

Michael H. Kalmanash, Fairfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1981, Ser. No. 259,383

Int. Cl.³ H04N *9/27*; H01J *29/80*

U.S. Cl. 358—73 **5 Claims**



1. A high voltage color switch for a beam penetration CRT in which a baseline color is normally displayed in a TV raster format but can be switched for a color write period of predetermined interval that is separated by an intervening period, comprising:

high voltage power supply means connectable to said cathode-ray tube, and having an output voltage selected to provide a predetermined baseline color;

a transformer connected between the output of said high voltage power supply means and said beam penetration CRT;

driver means connected to said transformer for amplifying an input waveform received during a color write interval and for providing a magnetizing current to said transformer;

a low voltage power supply means having a higher voltage portion and a lower voltage portion;

switch means connected between said higher voltage portion of said low voltage power supply means and said driver means for disconnecting said high voltage portion of said low voltage power supply means from said driver means after each color write interval; and

whereby said switch means between the high voltage portion of said low voltage power supply means and said driver means is opened after said color write period allowing said magnetizing current to reset over said intervening period.

4,468,692

METHOD FOR VARYING COLORS OF A PICTURE IMAGE, DISPLAYED IN A COLOR DISPLAY, FOR REPRODUCING A COLOR PRINTED MATTER

Mitsuhiko Yamada, Kyoto; Tukasa Nishida, Osaka, and Toshifumi Inoue, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 30, 1982, Ser. No. 412,725

Claims priority, application Japan, Sep. 16, 1981, 56-144792

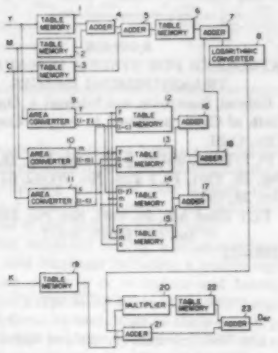
Int. Cl.³ G03F *3/10, 3/08*

U.S. Cl. 358—76 **3 Claims**

1. A method for varying colors of a picture image, displayed in a color display, for reproducing a color printed matter, wherein density signals of cyan, magenta, yellow and black, picked up from an original picture, are fed to a color display to display a color picture image corresponding to the color printed matter to be obtained, the improvement which comprises the steps of:

(a) converting color ink signals of cyan, magenta and yellow for recording a color printed matter into color separation density signals of red, green and blue by using first table memories;

(b) adding the converted color separation density signals one by one; and



(c) adding correction values for printing the color inks one above another, which are read out of second table memories depending on the color ink signals of the color inks to be printed one above another, to said added color separation density signals to obtain a corrected color component density signal.

4,468,693

VIDEO PRINTING APPARATUS

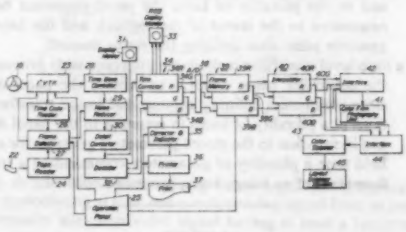
Shuji Fujita, Funabashi; Kennosuke Sugizaki, Hachioji, and Keiichi Kiyota, Kawasaki, all of Japan, assignors to Dai Nippon Printing Co., Ltd. and Ikegami Tsushinki Co., Ltd., both of Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 398,243

Claims priority, application Japan, Jul. 14, 1981, 56-108784; Aug. 10, 1981, 56-125000; Aug. 20, 1981, 56-129405; Dec. 4, 1981, 56-195325; Dec. 5, 1981, 56-195111; Dec. 5, 1981, 56-195112; May 18, 1982, 57-82368

Int. Cl.³ H04N *1/46*; G03F *3/08*

U.S. Cl. 358—78 **44 Claims**



1. A video printing apparatus for forming from a color video signal color separation films and/or a color film comprises

means for extracting a video signal of a desired frame in the input color video signal;

frame memory means for storing pixel signals of the video signal of the extracted frame;

means for reading out the pixel signals of video signal stored in said frame memory means;

interpolating means for effecting an interpolation in accor-

dance with the read out pixel signals to produce interpolated pixel signals;

color photography means including a flying spot scanner tube for displaying black and white images of the interpolated pixel signals at a first scanning speed and means for projecting the images displayed on the flying spot scanner tube onto a color photographic film by means of color filters to form the color film;

color scanner means for receiving the interpolated pixel signals to form color separation films at a second scanning speed; and

means for controlling said reading out means in such a manner than when the color film is formed, the pixel signals stored in the frame memory means are read out at a first timing related to said first scanning speed, and when the color separation films are formed, the pixel signals are read out of the frame memory means at a second timing related to said second scanning speed.

4,468,694

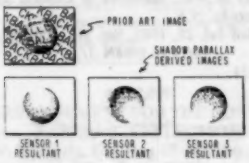
APPARATUS AND METHOD FOR REMOTE DISPLAYING AND SENSING OF INFORMATION USING SHADOW PARALLAX

Albert D. Edgar, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 221,222, Dec. 30, 1980, abandoned. This application Oct. 15, 1982, Ser. No. 434,690

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—93 **11 Claims**



1. Apparatus for detecting the location of an object in a selected area comprising:

flying spot scanner means for point by point scanning of said area;

a plurality of non-concentric sensor means spaced about said area such that each senses an independent shadow on a common perspective of said object in response to the point by point scanning of said flying spot scanner means; and

means for combining the point by point output of said sensor means to derive a resultant indicative of the location of said object.

4,468,695

ROBOT

Junichi Ikeda, Tokyo; Noriyuki Utsumi, and Yukio Otani, both of Yokohama, all of Japan, assignors to Tokico Ltd., Japan

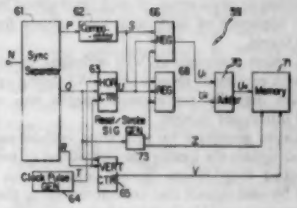
Filed Nov. 17, 1981, Ser. No. 322,375

Claims priority, application Japan, Nov. 20, 1980, 55-163731; Nov. 21, 1980, 55-164429; Nov. 21, 1980, 55-164431; Nov. 21, 1980, 55-164432

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—101 **15 Claims**

9. A robot comprising a platform, a movable arm movably connected to the platform for operation based on information prestored in a memory, a working assembly movably connected to one end of the arm, means for detecting the deviation between a position of the working assembly and a position of a portion of the workpiece to be worked, said detecting means comprising a slit image projector for projecting slit images on the portion of the workpiece to be worked, an image pick-up means for repeatingly picking up the slit images on the portion of the workpiece to be worked and delivering composite video signals on every slit image picked up, and a video signal processing device for processing the composite video signals to detect the deviation between the position for the working assembly and the position of the portion of the workpiece to be worked and delivering a signal indicating the deviation, said video signal processing device comprising a synchronization separation circuit for separating the composite video signals into video signals, horizontal synchronization signals, and vertical synchronization signals, and for delivering the separated signals, a binarization circuit for converting the video signals into binary signals of high and low levels depending on the luminous information contained in the video signals thus separated, a first counting circuit which is reset at least by one of the signals of the horizontal synchronization signals and the



vertical synchronization signals and counts the number of clock signals, a second counting circuit which is reset by the vertical synchronization signals and counts the number of the horizontal synchronization signals, a register for storing the contents in the first counting circuit upon generation of a leading edge in the binary signal from the binarization circuit, an addition circuit for adding contents in the first counting circuit upon generation of a trailing edge in the binary signal from the binarization circuit and the contents in the register, and a memory circuit for storing a data corresponding to the summed data calculated in the addition circuit into an address corresponding to the contents in the second counting circuit, and means for displacing the working assembly relative to the arm so as to compensate for the deviation detected by the detection means.

4,468,696

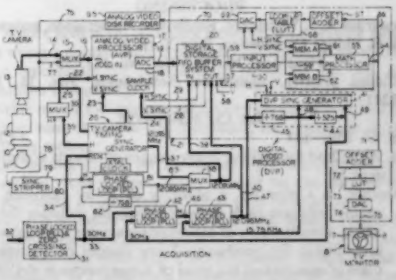
LINE-LOCKED DIGITAL FLUOROGRAPHY SYSTEM

Barry N. Stone, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,495

Int. Cl.³ H04M *5/32, 5/06*

U.S. Cl. 358—111 **6 Claims**



1. Digital fluorography apparatus comprising means for converting pre-contrast and a sequence of post-contrast X-ray images, obtained before or after an X-ray contrast medium arrives in blood vessels of interest in a body, to corresponding

optical images; a television camera having a target that is scanned to produce analog video signals representative of the optical images; an analog-to-digital converter (ADC) for converting successive samples of the analog signals in the horizontal lines comprising an image frame to a succession of digital pixel words having values corresponding to the intensities of the picture elements (pixels) in the frame, and means for eliminating the effect of power line frequency artifacts in the images, characterized by:

means for providing reset signals referenced to ac power line frequency and corresponding to television framd rate,

a crystal controlled oscillator based sync generator operative to produce vertical sync pulses followed by a sequence of horizontal sync pulses for the television camera and the sample clock frequency for timing sampling of the analog video signals by said ADC, said sync generator responding to occurrence of each reset signal by initiating a new sequence of horizontal sync pulses for the next image frame,

a digital video processor (DVP) including memory means and math processor means, said DVP being operative to substract digitally represented images and output the digital difference images,

a second sync generator for providing vertical and horizontal sync signals for timing the operations of said DVP,

phase-locked loop means having input means for being driven by said signals that are referenced to the ac power line frequency, said loop means being operative to provide signals that are coupled to said second sync generator for controlling it to produce said vertical and horizontal sync signals and to provide clock signals at a frequency corresponding substantially to said sample clock frequency,

a buffer system having input means for said digital pixel words from said ADC and having means to output said words to said DVP at a rate that differs from the rate at which the pixel words are input from the ADC,

clocking means that uses the sample clock frequency derived from said crystal controlled oscillator as a time base when operating in the image acquisition mode for clocking said pixel words into said buffer system and clocking means that uses the sample clock frequency derived from said phase-locked loop means for clocking said pixel words out of said buffer system,

means for converting the digital difference image frames that are output from the DVP to analog video signals representative of the frames, and

an analog video disk recorder for recording said analog video signals along with vertical and horizontal sync signals and to provide clock signals at a frequecy corresponding substantially to said sample clock frequency.

4,468,697

DEVICE FOR AND METHOD OF X-RAY IMAGE PROCESSING

Leonardus A. J. Verhoeven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,732

Claims priority, application Netherlands, Jun. 15, 1982, 8202417

Int. Cl.³ H04N *7/18*

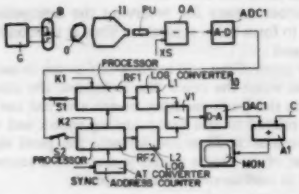
U.S. Cl. 358—111 **7 Claims**

1. A method for making X-ray images of objects comprising the steps of:

storing, in a memory, a plurality of X-ray exposure programs, wherein each exposure program includes the values of a multiplicity of exposure parameter settings which are suitable for producing X-ray images of a particular class of objects and the level of X-ray scatter in the object is determined by a combination of the values of at least two of said parameter settings, and an associated scatter radiation compensation value;

selecting one of said programs from said memory for producing an image of a particular object and adjusting the values of exposure parameter settings of X-ray aparatus to the values specified in said selected program;

irradiating said particular object with said X-ray apparatus in accordance with said selected values and producing an electric video signal which is representative of the amplitude of X-radiation which has passed through the object;



subtracting the value of said associated scatter radiation compensation signal from the amplitude of the video signal to generate a difference signal and generating a display signal which is proportional to the logarithm of the difference signal; and

producing a display having pixels whose brightness is proportional to a corresponding instantaneous amplitude of said display signal.

4,468,698

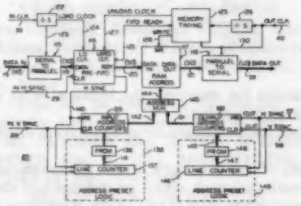
LINE-LOCKED DIGITAL FLUOROGRAPHY SYSTEM

Barry T. Kavoussi, Oconomowoc, and Eugene W. Bergholz, Dousman, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1982, Ser. No. 400,550

Int. Cl.³ H04N *5/32*

U.S. Cl. 358—111 **5 Claims**



1. In a digital fluorography system including a television (TV) camera whose target is scanned to convert x-ray image frames to corresponding analog video signals, a analog-to-digital converter (ADC) for converting successive samples of the analog signals in the horizontal scan lines to digital pixel words having values corresponding to the intensities of the picture elements (pixels) that compose the lines of the frames, a sync generator for providing the timing signals including the vertical and horizontal sync signals, for the TV camera and the sample clock signals for determining the sampling frequency of the ADC, digital video processor (DVP) means including means for subtracting an image frame from any image frame in sequence of frames to produce a sequence of difference images, means providing timing signals for the DVP including vertical and horizontal sync signals and sample clock signals that may differ slightly in phase and frequency or both from corresponding signals for the TV camera and the ADC, and,

a first-in, first-out (FIFO) buffer system interposed between the ADC and the DVP to compensate for said timing difference, comprising:

a serial-to-parallel converter for converting each predetermined number of serial pixel words that are output from said ADC to a parallel word,

producing a second clock pulse frequency for said converter

by dividing the ADC sample clock frequency by a number equal to the number of pixel words that are combined at a time by said converter to produce said parallel words,

pre-FIFO memory means for being loaded with successive parallel words from said serial-to-parallel converter in response to occurrence of clock pulses at said second frequency,

means for dividing said sample clock signals for said DVP by the number corresponding to the number of pixel words that are parallel to produce clocking signals for controlling said pre-FIFO memory to output said parallel words in first-in, first-out order,

random-access memory (RAM) means having input means or said output parallel words from said pre-FIFO and having output means, said RAM means being divided into a plurality of horizontal line segments each of which has a series of locations for the respective parallel words that compose a horizontal television line,

means responding to occurrence of the respective horizontal sync pulses that follow a frame initiating vertical sync pulse by addressing the parallel words from said pre-FIFO that make up the current horizontal line to be written in said horizontal line segments in succession and then recycling said addresses each time the last segment is filled,

means responsive to occurrence of the respective horizontal sync pulses that follow a frame initiating vertical sync pulse and a delay period by addressing the first line segment to read out it and following line segments in succession and then recycling said addresses each time the last segment is read out, and

a parallel-to-serial converter operative to convert the successive parallel words read out from said RAM locations to serial pixel words again.

4,468,699

CIRCUIT ARRANGEMENT FOR THE CONTROL OF THE VERTICAL DEFLECTION

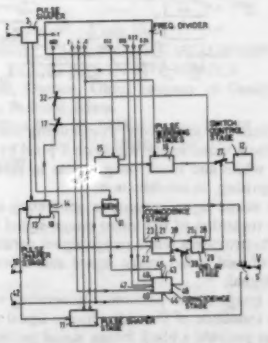
Klaus Kröner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 17, 1982, Ser. No. 358,985

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110890

Int. Cl.³ H04N *5/04*

U.S. Cl. 358—148 **16 Claims**



1. A circuit arrangement for producing a control signal for the field scanning stage in a television device which device is suitable for receiving a television signal incorporating line and field synchronizing pulses, and a plurality of fields constituting an image, said arrangement comprising:

a line generator for generating a signal having a frequency equal to the line frequency or to an integral multiple thereof,

a frequency divider circuit connected thereto for producing pulses at field frequency from said line generator signal,

signal comparison means,

means for applying received field synchronizing pulses and pulses produced by said frequency divider circuit to said signal comparison means for comparing the phase of said received pulses with the phase of the divider pulses,

means operatively connected to said signal comparison means for determining the time during which a given phase relationship exists in said signal comparison means between the pulses compared therein,

resetting means for applying received field synchronizing pulses to said frequency divider circuit for the resetting thereof,

first switching means responsive to said signal comparison means and adapted to be actuated between a direct synchronization operating mode in which the received field synchronizing pulses or a signal derived therefrom are applied to said field scanning stage and in an indirect synchronization operating mode in which the divider pulses are applied to said field scanning stage, the change from the direct to the indirect synchronization mode being effected when the given phase relationship in said signal comparison means has existed for a predetermined period of time and the change from the indirect to the direct synchronization mode being effected when said given phase relationship has not existed for said predetermined period,

and further comprising a field synchronization pulse test stage, said first switching means being further responsive to said field synchronization pulse test stage for being in the indirect synchronization mode when a predetermined number of received field synchronizing pulses is absent, said resetting means being enabled to reset said frequency divider circuit when said pulses are present again.

4,468,700

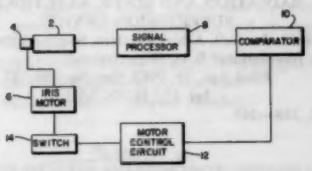
AUTOMATIC IRIS CONTROL LENS SYSTEM

William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.

Filed Mar. 15, 1983, Ser. No. 475,557

Int. Cl.³ H04N *5/26*

U.S. Cl. 358—228 **17 Claims**



1. A lens system for a camera mounted for scanning movement along a predetermined path and having an adjustable iris and a mechanism for automatically adjusting the iris, said mechanism comprising:

a drive motor for driving said iris to vary the size of said iris;

motor control means for controlling the operation of said drive motor;

light sensing means for measuring light entering said lens system from a scene being viewed by the camera and providing a signal indicative of such measurement;

comparison means coupled to said light sensing means for comparing the signal indicative of the level of light entering said lens system to a predetermined standard and in response to a difference between such signal and the predetermined standard providing a control signal to said motor control means;

switch means connected to said motor control means and said drive motor, said switch means enabling operation of

said drive motor only when said switch means is in its closed position; and,

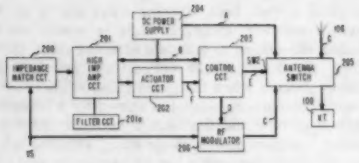
actuating means for closing said switch means only when the camera is at a preselected position along the path of movement of the camera.

4,468,701

VIDEO SIGNAL ACTUATED SWITCH

Dennis S. Barcher; David M. Dickson, and Jeffrey A. Walters, all of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,753
Int. Cl.³ H04N 5/22
U.S. Cl. 358—181 **15 Claims**



1. A video signal actuated switch characterized by

an amplifier circuit (**201**) for amplifying a particular band of frequencies comprising a known component frequency of a video signal (VS), the amplifier circuit providing an output signal,

an actuator circuit (**202**) for providing an actuating signal (F) responsive to the output signal of the amplifier circuit (**201**), and

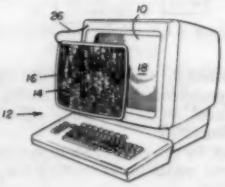
a control circuit (**203**), responsive to the actuating signal (F) of the actuator circuit (**202**), for controlling the selection of signals (C and G) for display by a video terminal (**100**).

4,468,702

RADIATION AND STATIC ELECTRICITY SUPPRESSION DEVICE

Louis H. M. Jandrell, Ashley Gardens, South Africa, assignor to Daca International B.V., Sligo, Ireland

Filed Apr. 16, 1982, Ser. No. 369,127
Int. Cl.³ H04N 5/65
U.S. Cl. 358—245 **9 Claims**



1. A radiation and static electricity suppression device for a cathode ray tube comprising:

a fine mesh fabric in which at least some of either the warp or weft fibers are electrically conductive and further that the electrically conductive fibers are generally evenly distributed across the mesh;

said fine mesh fabric conformable to the viewing surface of the cathode ray tube;

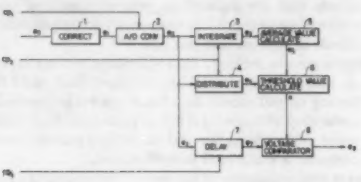
means for electrically connecting said electrical conductive fibers with said cathode ray tube.

4,468,703

IMAGE SIGNAL PROCESSING DEVICE

Fukumi Fujiwara, and Yoshio Arai, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,353
Claims priority, application Japan, May 15, 1981, 56-72281
Int. Cl.³ H04N 1/40; G06K 9/38
U.S. Cl. 358—282 **4 Claims**



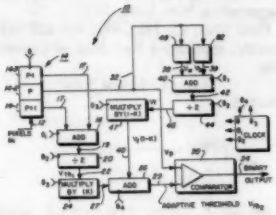
1. An image signal processing device, comprising: means for determining an average value x of an image signal over a predetermined period of time; means for determining a density distribution g(y) of said image signal over said predetermined period of time; means for calculating a threshold value α from said average value x and said density distribution g(y); and voltage comparator means for comparing said image signal with said threshold value α, to output a binary-coded image signal.

4,468,704

ADAPTIVE THRESHOLDER

James C. Stoffel, Rochester, N.Y.; To R. Hsing, Sudbury, Mass., and Jagdish C. Tandon, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 28, 1982, Ser. No. 437,974
Int. Cl.³ H04N 1/40
U.S. Cl. 358—282 **10 Claims**



1. Apparatus for adaptively thresholding the image pixels that comprise a video image signal on a pixel by pixel basis to distinguish white and black image areas in said video image signal, comprising, in combination:

(a) white image signal parameter generating means responsive to transition of the video image signal from black to white to provide a white image signal parameter equal to larger of said video image signal and a preset minimum white signal;

(b) black image signal parameter generating means responsive to transition of the video image signal from white to black to provide a black image signal parameter equal to smaller of said video image signal and a preset maximum black signal;

(c) first means for combining said white and black image signal parameters to provide an offset parameter for the pixel being processed;

(d) second means for combining said offset parameter with the video image signal of at least one neighboring pixel to provide a threshold level for thresholding said pixel being processed; and

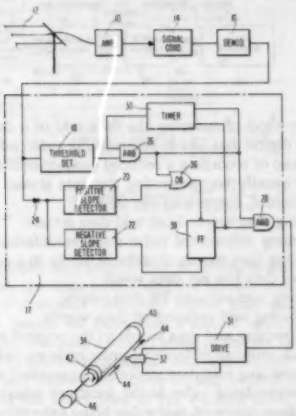
(e) thresholding means for thresholding said pixel with said threshold level.

4,468,705

DATA TRANSITION ENHANCEMENT

Jack D. Burton, Orlando, Fla., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 7, 1981, Ser. No. 328,143
Int. Cl.³ H04N *1/40, 5/14*
U.S. Cl. 358—284 **10 Claims**



4. A data enhancement apparatus for converting an analog signal to a binary signal comprising:

slope detector means for differentiating said analog signal; and

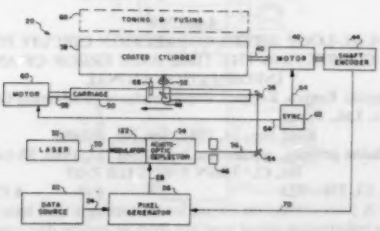
means for generating an output signal having one state in response to the detection of a first predetermined slope in one direction and another state in response to the detection of a second predetermined slope in another direction and below a predetermined slope magnitude.

4,468,706

IMAGING BY VARYING THE PLACEMENT OF ELEMENTS IN THE PIXELS

Lysle D. Cahill, Dayton, Ohio, assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Feb. 13, 1979, Ser. No. 11,320
Int. Cl.³ H04N *1/30*
U.S. Cl. 358—300 **38 Claims**



1. A method of imaging an electrophotographic member with an array of discharged elements of such configuration and placement to enable the member to be utilized for producing a graphic image upon a receptor by printing, said method comprising:

A. acquiring a series of digital words from a source of such words representative of the graphic image, each word representing a density of an incremental area of the graphic image,

B. providing a charged electrophotographic member upon which the graphic image is to be reproduced and discharging said member selectively by a fine beam of radiant energy which forms pixels over the area of the electrophotographic member, the member and fine beam being moved relative to one another in a predetermined program of movement, said fine beam generally being a composite of a plurality of individual rays but at times comprising as little as a single ray,

C. generating sample signals which are indicative of the said relative movement,

D. providing a store of beam modulating signals representing area-weighted patterns, each pattern being individual to a predetermined density of image of a pixel which is to be reproduced upon said electrophotographic member, and the beam modulating signals of each pattern being grouped together and arranged in rows and columns and defining where in the pixel there will be discharge elements to form said pattern on said electrophotographic member,

E. applying the digital words and the sample signals simultaneously to said store, each word being applied while a sequentially produced group of a particular number of the sample signals is applied, the digital words each being effective to select a group of beam modulating signals representative of a particular pattern which will result in said pixel upon the application of said rays,

F. the sample signals being effective to indicate the rows in the pixel where there will be discharged elements to form said pattern within said pixel,

G. the output from said store comprising, for each digital word and each row chosen, a plurality of beam modulating signals describing column by column the discharge elements for said pixel,

H. providing a source of radiant energy having a beam of such radiant energy,

I. splitting said beam into said plurality of rays in accordance with said output beam modulating signals and directing said rays as said fine beam against said electrophotographic member to form said pixel on said electrophotographic member,

J. effecting the formation of pixels for all of the digital words on said electrophotographic member and

K. toning said electrophotographic member.

4,468,707

HIGH SPEED IMAGING OF ELECTROPHOTOGRAPHIC FILM BY FINE BEAM SCANNING

Manfred R. Kuehnle, Lexington, Mass., and Lysle D. Cahill, Dayton, Ohio, assignors to Coulter Systems Corporation, Bedford, Mass.

Division of Ser. No. 153,689, May 27, 1980, Pat. No. 4,427,999, which is a continuation of Ser. No. 803,575, Jun. 6, 1977, abandoned. This application May 27, 1982, Ser. No. 382,628
Int. Cl.³ H04M *1/30*
U.S. Cl. 358—300 **13 Claims**

1. Apparatus for high speed imaging of an electrophotographic material comprising:

A. means for scanning a master image with a reading beam of energy that can be modulated in accordance with said optical variations of the master image and in accordance with a predetermined scanning pattern,

B. means for converting the modulations into a stream of electric signals,

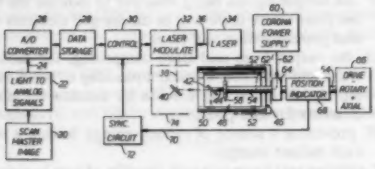
C. means for converting the stream of electric signals into a fine writing beam of radiant energy with modulations related to the modulations of the reading beam,

D. means mounting a member of electrophotographic material in darkness comprising a photoconductive coating capable of accepting and discharging a charge at high speed and formed of a thin film, transparent, microcrystalline, electrically and optically anisotropic, high quantum gain, wholly inorganic material,

E. means for charging a limited region of the coating of the member in darkness progressively at high speed to a surface charge potential capable of being fully discharged by said writing beam in accordance with the modulations thereof,

F. means for directing the writing beam successively to impact onto the charged limited region of the coating in darkness for discharging said charged limited region,

G. means for effecting high speed relative movement between the mounting means and directing means in a manner which causes the writing beam substantially to reproduce the said predetermined scanning pattern whereby to reproduce an overall latent charge image formed of regular geometric shapes consisting of an array of charged spot areas of said surface and fully discharged spot areas of said surface, each spot area being respectively equal to the area of each impact area of the fine beam with the charged spot areas of the surface having the same dark decay rate so that substantially all the charged spot areas within the latent charged image retain their charge value subject only to dark decay rate, the charged and discharged areas being distributed in an array reproducing



said predetermined scanning pattern representative of said master image,

H. means for developing said overall latent image subsequent to complete formation thereof,

I. said charging means constructed to charge only a limited region of said coating at a time,

J. said directing means comprising a movable carriage having a beam deflector for pointing the writing beam directly to the coating from a point on said carriage, and said charging means including a corona producing device mounted on said carriage spaced from said point in a direction which will bring the corona producing device progressively into proximity with each limited region of the coating before the writing beam impacts upon same, but at a rate the same as the scanning rate,

K. said mounting means comprising a support holding said electrophotographic member in a cylindrical configuration,

L. said carriage being arranged to move axially along the length of the electrophotographic member while at the same time the carriage and member are rotatably movable one relative to the other,

M. said carriage is movable on a line coaxially of the electrophotographic member,

N. said photoconductive coating being on the inside of the cylindrical configuration and,

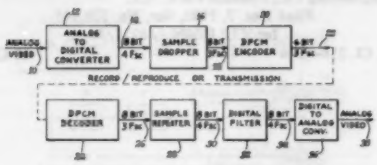
O. said carriage being rotatable on the axis defined by said coaxial line.

4,468,708

COMBINED DATA RATE REDUCTION SYSTEM

Charles H. Coleman, Jr., Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Oct. 30, 1981, Ser. No. 316,756
Int. Cl.[3] H04N 9/49
U.S. Cl. 358—310 16 Claims



1. A method of reducing the data rate of a data stream of multi-bit digital data words representing video information for the purpose of recording a reduced number of data words and for subsequently reconstructing the data stream upon reproducing thereof, comprising the steps of:

dropping data words from said data stream;

performing differential pulse code modulation on said remaining data words, thereby resulting in a reduced number of data bits per data word;

recording said reduced bit data words;

reproducing said reduced bit data words;

reconstructing said data words to the original multi-bit data words utilizing differential pulse code modulation; and

reconstructing said data stream by generating and inserting an interpolated value in the locations where data words had been removed, said value being determined by a finite response digital filter operating on said remaining data words.

2. A method as defined in claim 1 wherein the step of reducing the number of bits of a multi-bit data word comprises:

predicting the value of each data word utilizing the preceding predicted values of data words;

calculating the difference between the predicted and actual values; and

recording the difference value, wherein the difference value has a fewer number of data bits than originally comprised the data word.

3. A method as defined in claim 2 wherein the data words are a part of a digital representation of a scene.

4. A method as defined in claim 3 wherein each of said data words represents digital samples taken at a sampling rate that is an integral multiple of the subcarrier frequency of the video signal, the predicted value of each data word being accomplished utilizing preceding predicted values of data words, wherein the preceding predicted values are integral multiples of one subcarrier cycle relative to the sample data word being predicted.

4,468,709

DUAL-LOOP JITTER CORRECTION CIRCUIT FOR CORRECTING THE TIME BASE ERROR OF AN INFORMATION SIGNAL

Hideyuki Kenjyo, Koganei, Japan, assignor to Olympus Optical Co. Ltd., Japan

Filed Sep. 14, 1981, Ser. No. 302,090
Claims priority, application Japan, Sep. 17, 1980, 55-128879
Int. Cl.[3] H04N 9/44; G11B 7/00
U.S. Cl. 358—322 6 Claims

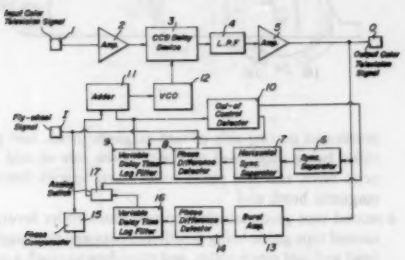
1. A jitter correction circuit for correcting a time base error of an information signal read out from an optical disc comprising:

a variable delay device having a variable delay time for correcting the time base error of an information signal;

a first closed loop control circuit having means for deriving a first synchronizing signal of a first frequency from an

information signal, means for generating a first reference signal, means for detecting a first phase difference between the first synchronizing signal and the first reference signal, and means for adjusting the delay time of said variable delay device in accordance with the first detected phase difference to correct the time base error of the information signal;

means for detecting said first phase difference and providing a control output when said phase difference is less than or equal to a predetermined value; and



a second closed loop control circuit having means for deriving from the information signal a second synchronizing signal of a second frequency higher than said first frequency, means for generating a second reference signal, means for detecting a second phase difference between the second synchronizing signal and the second reference signal, and means responsive to said control output for adjusting the delay time of the variable delay device in accordance with the second detected phase difference to correct the time base error of the information signal, said predetermined value corresponding to a residual time base error.

4,468,710

DIGITAL VIDEO RECORDER

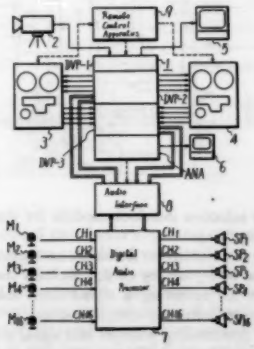
Yoshitaka Hashimoto, Chofu; Kaichi Yamamoto, Zama, and Norihisa Shirota, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 8, 1981, Ser. No. 252,086

Claims priority, application Japan, Apr. 11, 1980, 55-48480

Int. Cl.³ H04N *5/91*

U.S. Cl. 360—9.1 **11 Claims**



5. Information signal recording apparatus comprising:

converting means for converting an audio signal and a video signal into digital form;

multiplexing means for intermixing said digitized audio signal and said digitized video signal in a time sharing manner to form an intermixed signal;

processing means for processing both said audio and video signal by processing said intermixed signal; and

transducer means for recording said processed intermixed signal on a record medium.

4,468,711

MODE-SWITCHING LINKAGE FOR A TAPE CASSETTE APPARATUS

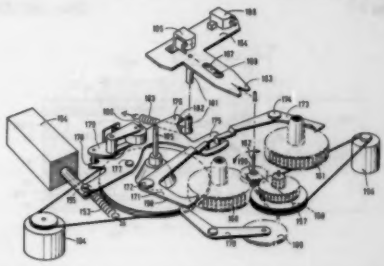
Johannes J. M. Schoenmakers, and Ghislanus M. A. M. Aldenhoven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,680

Claims priority, application Netherlands, Nov. 17, 1980, 8006257

Int. Cl.³ G11B *15/02*

U.S. Cl. 360—96.3 **10 Claims**



1. A magnetic tape apparatus comprising:

two reel discs for driving tape reels,

a capstan arranged to engage a tape extending between the reels,

a pressure roller movable toward said capstan for urging tape against the capstan,

a central drive wheel, and means for rotatably driving said wheel,

a pivotable normal-mode idler arm having a normal-mode idler arranged thereon for rotation,

a pivotable fast-mode idler arm having a fast-mode idler arranged thereon for rotation, said idler arms being respectively movable between respective inoperative and operative positions,

means for driving at least one of said reel discs responsive to rotation of said central drive wheel while one of said idler arms is in an operative position,

a pivotable switching lever,

means responsive to said lever position for positioning the idler arms and pressure roller, and

means, including a central actuating device, for pivoting said lever,

characterized in that said means for rotatably driving selectively drives the central drive wheel in either direction,

said means for positioning includes means for uncoupling the fast-mode idler arm and, responsive to the direction of the central drive wheel rotation, for moving the fast-mode idler arm from an inoperative central position between the reel discs into a first or second operative position to drive one or the other reel disc,

said means for pivoting moves the pivoting lever solely by the central actuating device, and

said apparatus further comprises control means which can be set to first and second positions, for selectively limiting pivotable movement of said lever from a rest position to a first, partly pivoted position or to a second, fully pivoted position; in said first position, said fast-mode idler arm

being uncoupled from the switching lever, and said means for positioning maintaining the normal-mode idler arm in the inoperative position; in said second position said means for positioning maintaining the fast-mode idler arm in the inoperative position, and maintaining the normal-mode idler arm in the operative position, and

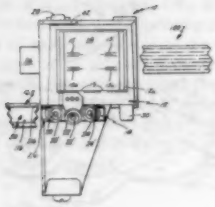
means for coupling the head slide to the switching lever for moving the head slide to a fast-mode position or normal-mode position respectively as the switching lever moves to the partly or fully pivoted positions.

4,468,712

POSITIONER APPARATUS FOR TAPE RECORDER HEADS

Joseph H. Mueller, Tecumseh; Ronald G. Dawson, and Samuel N. Irwin, both of Ann Arbor, all of Mich., assignors to Irwin International, Inc., Ann Arbor, Mich.

Filed Jul. 2, 1981, Ser. No. 280,139
Int. Cl.³ G11B *5/55, 21/08*
U.S. Cl. 360—106 **40 Claims**



1. Tape recorder transducer positioning means for mounting, moving and guiding the movements of a transducer head transversely with respect to the longitudinal axis of a recording tape, comprising in combination: a carrier for mounting a transducer in relatively fixed position thereupon, and a transducer mounted thereupon; an anchor member having means for securing same in fixed position upon a given support surface; means defining at least a pair of generally parallel elongated guide surfaces disposed generally adjacent and parallel to said tape and having axes disposed transversely with respect to the longitudinal axis of said tape, said guide surfaces being supported upon at least one of said carrier and said anchor block, and slidably engaging the other thereof, means for normally maintaining said carrier and said anchor block in contact with said elongated guide surfaces; cam follower means coupled to said carrier to move the carrier and the transducer mounted thereupon longitudinally along said elongated guide surfaces upon cam actuation of the follower means; and a cam means disposed in alignment with said follower means for engaging the same upon cam movement to thereby move the follower means, the carrier and the transducer along said guide surfaces, generally parallel to said tape and width-wise with respect thereto.

4,468,713

TAPE RECORDER TAPE GUIDE MECHANISM FIXED ON PINCH ROLLER LEVER

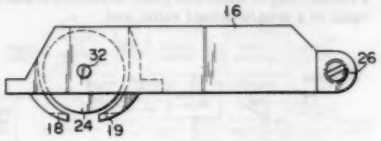
Akira Osanai, Tokyo, Japan, assignor to Olympus Optical Co., Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,473
Claims priority, application Japan, Dec. 15, 1980, 55-176876
Int. Cl.³ G11B *15/60*
U.S. Cl. 360—130.21 **16 Claims**

1. In a tape recorder comprising a base, a head lever pivotally mounted on the base about a rotation center, a magnetic head mounted on the head lever and positioned apart from said rotational center of the head lever, a capstan rotatably mounted on the base and positioned adjacent to said rotational center of the head lever, a pinch roller lever pivotally mounted on the base, and a pinch roller rotatably supported by the pinch roller lever and adapted to pinch a magnetic tape together with the capstan to drive the magnetic tape,

the improvement comprising improved tape guide means for guiding the magnetic tape, said improved tape guide means including:

a first tape guide mounted on said head lever and being



positioned on one side of said magnetic head, said pinch roller being positioned on the opposite side of said magnetic head, and said pinch roller being spaced from said magnetic head; and

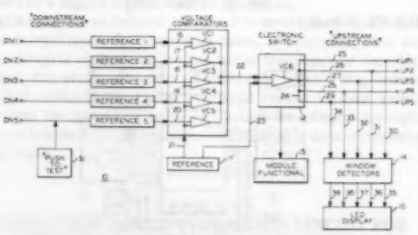
a second tape guide attached to said pinch roller lever, said second tape guide being positioned between said magnetic head and said pinch roller, and extending to reach a region near said capstan.

4,468,714

ZONE SELECTIVE INTERLOCK MODULE FOR USE WITH STATIC TRIP CIRCUIT BREAKERS

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,203
Int. Cl.³ H02H *3/00, 7/00, 3/20*; G01R *27/00*
U.S. Cl. 361—62 **15 Claims**



1. A zone selective interlock module for static trip circuit breakers comprising:

a plurality of downstream terminals, each connecting with at least one of a plurality of downstream static trip circuit breakers for receiving a signal from said plurality of downstream static trip circuit breakers;

means for determining whether said signal is indicative of a downstream fault condition; and

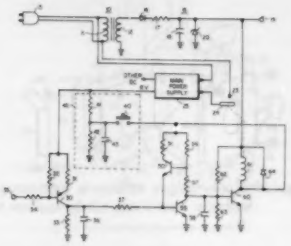
a plurality of upstream terminals, each connecting with a different one of a plurality of upstream circuit breakers for transmitting a signal to said plurality of upstream static trip circuit breakers to indicate said fault occurrence.

4,468,715

ON/OFF AND SHUTDOWN CIRCUIT FOR CRT PROJECTION SYSTEM

James J. Reno, Jr., Schaumburg, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 9, 1983, Ser. No. 493,084
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—186 **7 Claims**



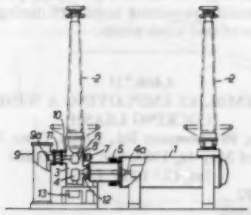
1. In combination:
a main power source;
a shutdown circuit, including a control transistor having a relay winding in its load circuit for controlling energization of said main power source;
a standby power source connected to said relay winding;
a latch transistor coupled to said control transistor and deriving its operating power through said relay winding; and
momentary contact switch means for enabling said latch transistor and disabling said control transistor and enabling said control transistor and disabling said latch transistor to effect on/off control of said main power source.

4,468,716

GAS-INSULATED SWITCHGEAR

Isao Kamata, Sagamihara, and Satoshi Ohyama, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 18, 1982, Ser. No. 349,901
Claims priority, application Japan, Feb. 27, 1981, 56-26907
Int. Cl.³ H02B *5/02*
U.S. Cl. 361—333 **5 Claims**



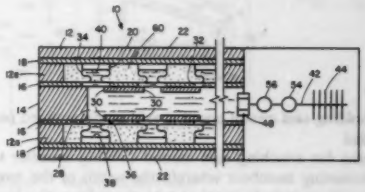
1. A gas-insulated switchgear apparatus comprising:
(a) a first grounded tank filled with insulating gas;
(b) a circuit breaker unit enclosed in said first tank;
(c) a second grounded tank filled with insulating gas;
(d) a disconnecting switch unit enclosed in said second tank, said disconnecting switch unit being connected to an axial extension of said first tank and being partitioned off said first tank through a gas;
(e) a third grounded tank filled with insulating gas, said third tank having a connecting conductor, being connected to an axial extension of said second tank, and being partitioned off said second tank through a gas;
(f) a first bushing vertically mounted on said first tank;
(g) a second bushing vertically mounted on said third tank;
(h) a grounding switch connected to said connecting conductor and mounted on said third tank on the opposite side from said disconnecting switch unit so as to form said circuit breaker unit, said disconnecting switch unit and said grounding switch being in a straight line; and
(i) a lightning arrester connected to said connecting conductor and mounted on said third tank, said lightning arrester being positioned under said grounding switch and in parallel with the axis thereof.

4,468,717

APPARATUS FOR COOLING INTEGRATED CIRCUIT CHIPS

Joseph S. Mathias, Riverton, N.J., and Faquir C. Mittal, Audubon, Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 9, 1982, Ser. No. 386,484
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—382 **3 Claims**



1. An integrated circuit chips cooling module comprising:
a housing;
a cold plate in the housing forming a fluid coolant passage having an inlet and an outlet;
a pair of opposed heat conducting plates abutting said cold plate and spaced apart thereby, said heat conducting plates being adjacent said passage and including apertures in fluid communication with said passage;
a board associated with each heat conducting plate and spaced therefrom by a portion of said housing defining a cavity between each board and said respective heat conducting plate;
chips mounted on each board and extending into an adjacent one of the cavities;
bellows connected to each of said heat conducting plates in fluid communication with each aperture, said bellows extending into an adjacent one of the cavities in flexible abuttment with an associated chip;
a coolant coil having a self-contained coolant therein, said coil having a first end connected to said inlet and a second end connected to said outlet;
means connected with said coil for urging said coolant through said passage; and
one-way check valves connected to said coil respectively adjacent said inlet and said outlet.

4,468,718

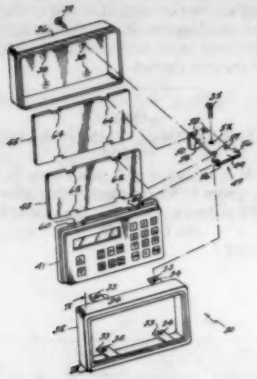
ENCLOSURE AND MOUNTING MEMBER FOR PRINTED CIRCUIT BOARDS

John E. Main, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 13, 1982, Ser. No. 367,877
Int. Cl.³ H05K *5/03*
U.S. Cl. 361—399 **34 Claims**

1. An enclosure for an electrical device having at least one printed circuit board, comprising:
first and second housing members cooperating to define the enclosure for the electrical device;
at least two mounting members for joining said first and

second housing members by providing rigid support thereto and holding said printed circuit board at a predetermined position between said first and second housing members, each mounting member extended from said first housing member and including means adapted to cooperate with means associated with said circuit board for



holding said circuit board at said predetermined position; and

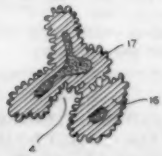
means for attaching said second housing member to said mounting members wherein the width of the mounting members include notched tabs therealong, the length of which notches are substantially the same as the thickness of the circuit board.

4,468,719

POROUS BODY FOR A SOLID ELECTROLYTIC CAPACITOR AND PROCESS FOR PRODUCING THE SAME

Shigeaki Shimizu; Yoshimi Kubo; Tetsuo Suzuki; Takashi Kizaki, and Hitoshi Igarashi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1981, Ser. No. 250,408
Claims priority, application Japan, Apr. 2, 1980, 55-43325
Int. Cl.³ H01G 9/00; B22F 1/00
U.S. Cl. 361—433 **3 Claims**



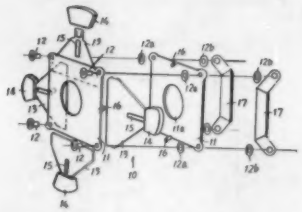
1. A porous body for a solid electrolytic capacitor, said body comprising a number of Ti-Al alloy particles in at least partial contact with each other to form an integral body, the surface of the respective Ti-Al alloy particles having a fine ruggednesses with surface irregularities in a size within a range of 0.5 to 5 μm, and the Al content of the Ti-Al alloy being in a range of from 50 to 70 atomic %.

4,468,720

VARIABLE MASK DEVICE FOR AN ILLUMINATOR

Akira Arai, 32-7 Soshigaya 1-chome, Setagaya-ku, Tokyo-to, Japan

Continuation of Ser. No. 52,753, Jun. 28, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 295,620
Claims priority, application Japan, Jul. 10, 1978, 53-84368
Int. Cl.³ F21V 11/18
U.S. Cl. 362—281 **7 Claims**



1. A variable mask device comprising:

a housing;

a support for positioning the housing in a preselected angular position;

an illuminator operatively mounted at one end of said housing;

an adjustable lens operatively mounted at an end of said housing displaced from said illuminator;

a plurality of variable mask plates operatively positioned within said housing and being disposed between said illuminator and said lens for varying an aperture shape and size of the output light of said mask device;

a support frame;

said plurality of variable mask plates being selectively, adjustably positioned within said support frame, said support frame being operatively disposed within a slidable frame mounted for inclination and rotation in two separate transverse directions with respect to a projection axis passing longitudinally through the variable mask device from said illuminator to said lens;

wherein the plurality of mask plates are selectively, respectively inclinable and rotatable in each of said two separate transverse directions with respect to the projection axis to modify the shape of an area to be illuminated without changing an angle of inclination of said projection axis with said housing remaining stationary during inclination and rotation of said mask plates.

4,468,721

CANDLE ASSEMBLIES EMPLOYING A WINDOW SILL LOCKING LEASH

Steven Vandrilla, 98 Thompson Rd., Berlin, Conn. 06037

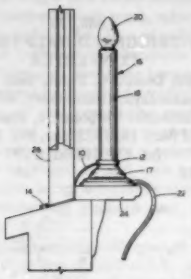
Filed May 11, 1983, Ser. No. 493,687
Int. Cl.³ F21P 1/02
U.S. Cl. 362—392 **18 Claims**

1. In combination:

A. a candle having a shank; and

B. a unitary candle retainer leash for use on window sills of double hung windows and the like comprising an elongated, thin flexible planar stem extending from said candle and dimensioned to extend from said candle when placed on a window sill and under the associated window, said leash being formed from a resin exhibiting good flexural characteristics at low temperatures, said stem being not greater than 3/16 inches thick and of at least about 4 inches in length and being sufficiently flexible and thin to bend readily about the inside edge of the associated window sill and about the lower edge of the associated window so as to avoid interference with the closing of the associated window, means at one end of said stem engaged

with said candle, and upstanding tab means of at least about ¼ inches in height at the other end thereof providing



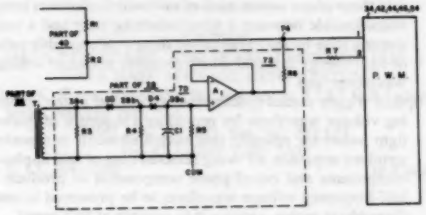
an upstanding abutment surface for locking against the outer surface of the associated window.

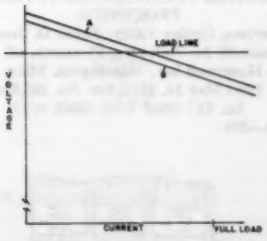
4,468,722

POWER SUPPLY HAVING SLOPE CONTROLLED OUTPUT VOLT-AMPERE CHARACTERISTIC

Neil A. Kammiller, Lakewood, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Jul. 28, 1982, Ser. No. 402,633
Int. Cl.³ H02P *13/22*
U.S. Cl. 363—71 **8 Claims**





1. A circuit for use in a power supply to control the slope of its output volt-ampere characteristic so as to allow at least two of said supplies to share a load on a substantially equal basis said supply deriving a signal representative of its output voltage and having a regulation means responsive to said output representative signal to thereby regulate said output voltage to a predetermined amplitude said voltage representative signal being connected to said regulation means at a predetermined junction, said circuit comprising:

(a) means responsive to the output current of said supply to derive a d-c signal representative thereof; and

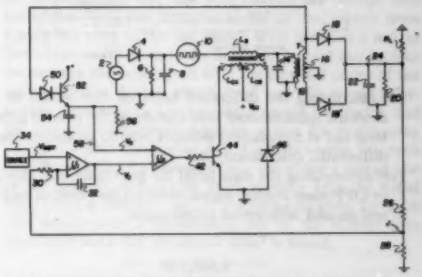
(b) modifying means connected to said predetermined junction and responsive to said current representative signal for generating at said junction a signal which changes linearly with changes in said output current, said voltage representative signal changing in a linear manner opposite to the change in said modifying means signal to thereby keep the sum of said signals at said junction constant whereby said slope is controlled.

4,468,723

MAGNETICALLY REGULATED POWER SUPPLY

William L. Hughes, Hackettstown, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 257,017, Apr. 24, 1981, abandoned. This application Mar. 3, 1983, Ser. No. 470,341
Int. Cl.³ H02P *13/12*
U.S. Cl. 363—82 **2 Claims**



1. A power supply comprising

a source of voltage pulses, a regulating inductor wound on a core, a transformer having primary and secondary windings, said source, said regulating inductor and said primary winding being coupled so as to produce voltage variations across said secondary winding having an amplitude determined by the inductance of said regulating inductor,

rectifying means coupled to said secondary winding so as to produce an output parameter,

a source of reference signal corresponding to a desired value of said output parameter,

means for deriving a parameter control signal corresponding to the difference between the output parameter provide by said rectifier and said reference signal,

demodulation means for detecting the amplitude modulation of the voltage across one of said primary and secondary windings of said transformer,

a control winding wound on said core, and

means for controlling the current in said control winding in response to the difference between the output of said demodulation means and said parameter control signal.

4,468,724

METHOD AND APPARATUS FOR CONTROLLING LOAD CURRENT

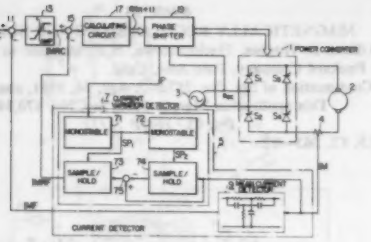
Tsutomu Omae; Toshihiko Matsuda, and Makoto Tachikawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1982, Ser. No. 365,092
Claims priority, application Japan, Apr. 8, 1981, 56-51815; Oct. 5, 1981, 56-159294
Int. Cl.³ H02P *13/26*
U.S. Cl. 363—88 **18 Claims**

1. A method of controlling the electric current for a system including a power source, a load, and a converter provided between said power source and said load and comprising a regulating means capable of controlling the mean value of a load current supplied from the power source to the load in response to an ON-state or OFF-state control signal, said method comprising the steps of:

(i) receiving a command value of the mean load current;

(ii) detecting the mean load current;
(iii) detecting the instantaneous value of the load current with a predetermined timing at successive points in time;
(iv) calculating the difference between said command value of the mean load current and said detected mean load current to produce a first differential calculation;



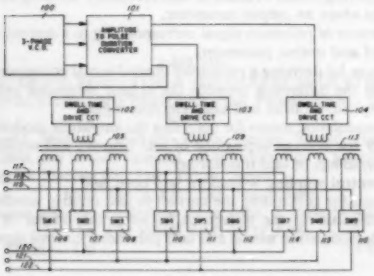
(v) calculating the difference between two values of said detected instantaneous load current at the present point of time and at a preceding point of time to produce a second differential calculation; and
(vi) determining the time point for providing said ON-state or OFF-state control signal based on the result of said first and second differential calculations.

4,468,725

DIRECT AC CONVERTER FOR CONVERTING A BALANCED AC POLYPHASE INPUT TO AN OUTPUT VOLTAGE

Marco Venturini, Milan, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 18, 1982, Ser. No. 390,000
Int. Cl.³ H02P 5/34; H02M 5/27
U.S. Cl. 363—160 **32 Claims**



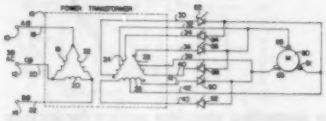
1. A direct AC converter including input phase conductors for a balanced polyphase AC input voltage system; a plurality of output phase conductors for a polyphase AC output voltage system having at least one characteristic such as frequency, amplitude, phase angle or phase displacement which is different from that of the input voltage system; a plurality of bidirectional switch means for individually connecting each input conductor to each output phase conductor; means for producing a repeated sequence of mutually abutting width-modulated drive pulses; and means for utilizing said drive pulses to operate said bidirectional switch means at a frequency substantially higher than the frequencies of both the input and output voltage system, to connect, in respect to each output phase conductor, only one input phase conductor at a time to that output conductor and for connecting all of said input phase conductors to said at least one output phase conductor a plurality of times during any cycle of said input system or of said output system.

4,468,726

OPTICALLY-TRIGGERED HALF-FREQUENCY AC CONVERTER

Louis J. L. Daigle; Donald C. Paine, both of Manchester, and Anthony J. Bednarczyk, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 10, 1982, Ser. No. 376,899
Int. Cl.³ H02M 5/257
U.S. Cl. 363—161 **5 Claims**



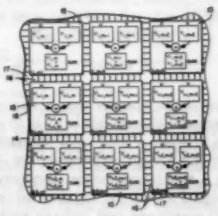
1. A half-frequency AC converter positionable between a three-phase source of electrical energy and a three-phase motor comprising:
a three-phase transformer means connected to said source of electrical energy for reducing the magnitude of an incoming voltage waveform, and for providing a secondary voltage waveform having an in-phase component and out-of-phase component;
a plurality of optically-triggered switch elements connected between the output of said three-phase transformer and said three-phase motor, each of said switch elements being transitionable between a nonconducting state and a conducting state by the presentation thereto of a suitable pulse of light energy together with a properly polarized voltage waveform; and
optical trigger means synchronously coupled to the incoming voltage waveform for providing a sequence of spaced light pulses for enabling said switch elements in a predetermined sequence, allowing selected ones of said in-phase components and out-of-phase components to produce a half-frequency voltage waveform to be presented to said three-phase motor, causing it to operate at half speed.

4,468,727

INTEGRATED CELLULAR ARRAY PARALLEL PROCESSOR

Craig L. Carrison, Golden Valley; James D. Joseph, Oakdale, and Patrenahalli M. Narendra, Plymouth, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 14, 1981, Ser. No. 263,536
Int. Cl.³ G06F 7/00; G06K 9/12
U.S. Cl. 364—200 **67 Claims**



17. A monolithic integrated circuit parallel signal processing system for processing signal samples, and entities derived therefrom, said samples and derived entities formed as distinct charge aggregations, said system comprising:
a semiconductor material body of a first conductivity type

except in selected regions thereof including first, second, third and fourth selected regions, said semiconductor material body having a first major surface;

an intercellular communications mesh, substantially adjacent said first major surface, having a plurality of connecting portions placed between cell locations with each said connecting portion also occurring between two intersection locations where each said intersection location is such that a plurality of said connecting portions are joined thereby, each said connecting portion comprising a charge-transfer device capable of substantially translating distinct charge aggregations and with a plurality of said cell locations each being completely surrounded by certain of said connecting portions and said intersection locations; and

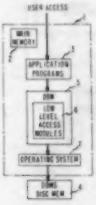
a plurality of signal processing cells each of which is located at a corresponding one of said cell locations, each said signal processing cell being capable of receiving distinct charge aggregations from a said connecting portion charge-transfer device bounding at least in part a said cell location corresponding to that said signal processing cell, each said signal processing cell being capable of performing a selected sequence of a selected number of signal processing operations upon distinct charge aggregations received by that said signal processing cell as aforesaid, and each said signal processing cell being capable of transferring distinct charge aggregations, representing results of that said signal processing cell performing said selected sequence, as aforesaid, to a said connecting portion charge-transfer device bounding at least in part a said cell location corresponding to that said signal processing cell.

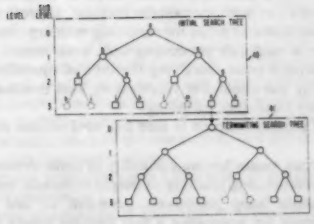
4,468,728

DATA STRUCTURE AND SEARCH METHOD FOR A DATA BASE MANAGEMENT SYSTEM

Chung C. Wang, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 25, 1981, Ser. No. 277,103
Int. Cl.³ G06F *9/00, 7/00*
U.S. Cl. 364—200 **10 Claims**





1. A data base management system including

a processor,

a main memory (2),

a large storage secondary memory (4), and

a data structure contained in the main and secondary memories comprising

a plurality of storage files (BNG pages 60, GLPAM pages 80, BNR pages 90) contained in the secondary memory, and

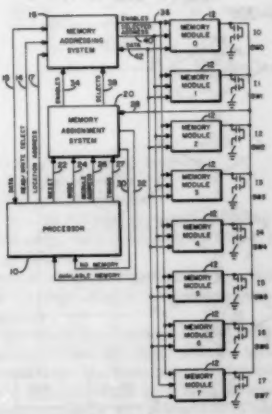
a plurality of search trees (bit vectors 32, 36 and 73) hierarchically arranged in a plurality of search levels beginning with an initial tree (40) contained in the main memory, each tree containing ordered data defining parent nodes and terminal nodes of the tree, wherein a numerical representation of a path through parent nodes of the tree to reach any said terminal node of the tree defines a logical memory address of one of the storage files, and each terminal node of the search trees in a last search level defines a logical memory address of a terminating one of the storage files, and in which each of the storage files associated with the terminal nodes of the search trees except the trees in the last search level contains a link to one of the search trees in the next search level and each of the storage files associated with the terminal nodes of the search trees in the last search level contains stored information pertaining to a unique input search parameter, and the processor comprises program means for partitioning an input search parameter into a subparameter for each search level and for consecutively searching a linked one of the trees in each search level, starting with the initial tree, using a different one of the subparameters for each tree search until a terminating one of the storage files associated with the last search level is found.

4,468,729

AUTOMATIC MEMORY MODULE ADDRESS ASSIGNMENT SYSTEM FOR AVAILABLE MEMORY MODULES

Albert H. Schwartz, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,600
Int. Cl.³ G06F *13/06;* G11C *5/06, 7/00*
U.S. Cl. 364—200 **17 Claims**



1. In a data processing system having a plurality of memory modules physically mounted to provide interlock signals when in the system, circuitry for providing reset signals, circuitry for providing module addresses when accessing memory, an automatic memory module address assignment system comprising:

a plurality of memory assignment register means, each associated with a different one of the plurality of memory modules and for storing memory module addresses as they are assigned;

set-up control means responsive to received reset signals for setting each of said plurality of memory assignment register means to store an illegal memory module address and for providing initializing signals;

interlock scan means coupled to said set-up control means and responsive to reset signals and said initializing signals, for providing set enabling signals to respective associated ones of said plurality of memory assignment register means for memory modules found present in the system, whereby memory modules available in the system are assigned memory module addresses in a predetermined relationship and any memory module determined to be missing is effectively ignored in accessing by said illegal memory module address stored in the associated one of said plur 'ity of memory assignment register means, said interlock scan means including—

scan counter means coupled to said set-up control means and responsive to said initializing signals to be set to an initial condition in response thereto for providing timed scan counts for each memory module in the system; and

memory assignment counter means responsively coupled to said set-up control means to be initialized to an initial condition in response to said initializing signals and coupled to said plurality of memory assignment register means for storing an associated memroy assignment count in enabled ones of said plurality of memory assignment register means; and

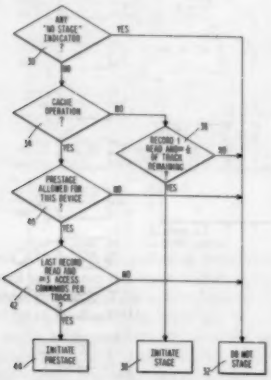
memory capacity counter means responsively coupled to said scan counter means and to said set-up control means for being set to an initial condition in response to said initializing signals, and for determining the count of memory modules available in the system.

4,468,730

DETECTION OF SEQUENTIAL DATA STREAM FOR IMPROVEMENTS IN CACHE DATA STORAGE

P. David Dodd; Ronald L. Blickenstaff; Richard L. Coulson; Robert J. Moreno, all of Boulder, and Brian E. Trede, Lafayette, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 27, 1981, Ser. No. 325,350
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **12 Claims**



1. A method for increasing efficiency of operation of a computer system of the class comprising:

a host computer including an arithmetic and logic unit and main memory means; and

a data storage unit comprising a long-term magnetic data storage means, a solid-state caching memory means and a cache manager means,

said data storage unit being connected to said host computer by a channel, said channel comprising means for communication of commands and data between said host computer and said data storage unit, the commands output by the host to the data storage unit in calling for data not including an indication of whether data called-for is part of a sequence of such requests;

said method comprising the following steps, performed by said data storage unit solely under control of said cache manager, and external to said channel and said host computer:

examining the data called for by the host from the long-term magnetic memory means;

determining if the called-for data contains indicators indicating that the called-for data is not part of a sequential data stream;

staging data not called for by said host computer to said cache memory means upon determination that said called-for data does not contain said indicators, said not called-for data staged to said cache memory being stored on said long-term magnetic storage media in a predetermined physical relationship to said called-for data; and

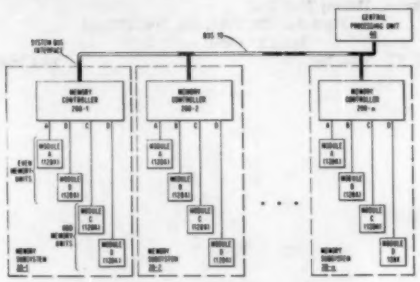
avoiding staging data to said cache memory means upon determination that said called-for data contains indicators that the called-for data is not part of a sequential data stream.

4,468,731

IDENTIFICATION APPARATUS FOR USE IN A CONTROLLER TO FACILITATE THE DIAGNOSIS OF FAULTS

Robert B. Johnson, Billerica; Chester M. Nibby, Jr., Peabody, and Edward R. Salas, Billerica, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 15, 1981, Ser. No. 330,971
Int. Cl.³ G06F *11/10*
U.S. Cl. 364—200 **41 Claims**



16. A data processing system comprising a data processing unit and a memory system including a plurality of addressable memory controllers, each controller for controlling the operation of a number of memory modules and said controllers being coupled in common to a bus for receiving memory commands and data from said data processing unit, each memory command including a code specifying the type of operation to be performed by the controller specified by said command and each memory controller including:

a control section coupled to said bus, said section comprising:

first circuit means having a plurality of input terminals and a corresponding plurality of output terminals, said input terminals being selectively prewired to said output terminals for generating a first multibit binary code at said output terminals designating the type of design used in constructing said each controller;

second circuit means having a plurality of input terminals and a corresponding number of output terminals, said input terminals being selectively prewired to said out-

put terminals for generating a second multibit binary code at said output terminals designating the hardware revision of each said controller; and

decode circuit means coupled to said bus, said decode circuit means being operative in response to a first diagnostic predetermined type of memory command to generate a first output signal; and

a multibit identification register operatively coupled to said bus, said identification register including at least one control terminal coupled to said decode circuit means and a number of input terminals, a first group of said number of input terminals being connected to said output terminals of said first circuit means and a second group of said number of input terminals being connected to said output terminals of said second circuit means, said register being conditioned by said output signal to apply said first and second multibit binary codes to said bus for transfer to said data processing unit for enabling selection of diagnostic test and verification routines for testing said each controller.

4,468,732

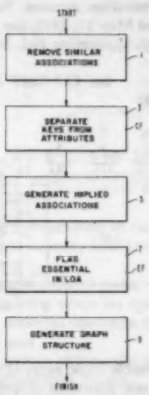
AUTOMATED LOGICAL FILE DESIGN SYSTEM WITH REDUCED DATA BASE REDUNDANCY

Norman Raver, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 645,780, Dec. 31, 1975, abandoned. This application Apr. 28, 1980, Ser. No. 144,116

Int. Cl.³ G06F 7/00

U.S. Cl. 364—200 **17 Claims**



1. A method for generating an integrated data base design structure for multiple applications on an interactive terminal computing system, comprising the steps of:

storing local views of data elements of each application of said multiple applications with each of said local views including first indication of forward association and second indication of backward associations between each of said data elements having associations therebetween, said first and second indications specifying whether each of said associations involve a single occurrence of the association, multiple occurrences of the association or a conditional occurrence of the association, and whether each of said data elements is unique;

sorting said indications into a first table of entries to form a list of associations;

removing all associations from said list of associations which have a similar key;

separating unique data elements from non-unique data elements in said list of associations;

calculating implied associations by scanning said list of associations to find any two association entries each of which has a single occurrence of the association and for which there is a common data element therebetween;

storing said implied association into a second table of entries to form an implied association list;

determining essential associations by scanning said list of associations for all single occurrence type associations and comparing each entry having a single occurrence type of association with each of the entries scanned in said implied associations list to determine if any entry in the implied association list corresponds to an entry in the list of associations and marking any entry in the list of associations for which there is a corresponding entry in the implied association list as nonessential and any entry in the list of associations for which there is no corresponding entry in the applied association list as essential; and

storing a graphic representation of said design structure by combining said first table of entries and said second table of entries to minimize data redundancy in the data base design structure.

4,468,733

MULTI-COMPUTER SYSTEM WITH PLURAL SERIAL BUS LOOPS

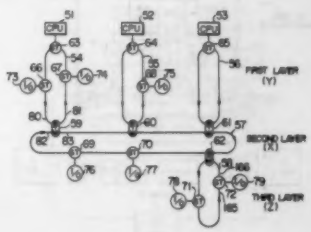
Toshihisa Oka, Katsuta; Hiroaki Nakanishi, Hitachi; Ryoichi Takamatsu, Hitachi; Takayuki Morioka, Hitachi; Masakazu Okada, Hitachi; Hideyuki Hara, Hitachi, and Hirokazu Kasashima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1981, Ser. No. 270,549

Claims priority, application Japan, Jun. 4, 1980, 55-74337; Jun. 4, 1980, 55-74338; Jun. 4, 1980, 55-74339; Jun. 4, 1980, 55-74340

Int. Cl.³ G06F 15/16

U.S. Cl. 364—200 **4 Claims**



1. A multi-computer system comprising:

a plurality of data processors;

at least one input/output device;

a first layer of serial bus loop hierarchy including a plurality of serial bus loops, each being coupled with at least one of said data processors;

a second layer of serial bus loop hierarchy including at least one serial bus loop coupled with said at least one input-/output device;

respective interbus linkage devices coupling the respective serial bus loops of said first layer with the serial bus loop of said second layer, the input/output device coupled with said second layer serial bus loop being accessible by the data processors coupled with at least two of said first layer serial bus loops through said first layer serial bus loop, a linkage device, and said second layer serial bus loop;

a plurality of stations, each station coupling a data processor or the input/output device to a serial bus loop;

each of said interbus linkage devices and said stations including means for sending and receiving a transfer frame carrying information between a data processor and said input/output device and comprising at least an input/output address field including a plurality of sub-fields for

storing addresses representing a map of those of the linkage devices and the stations which are to be passed, in that order, by the transfer frame sent between one of the processors and the input/output device, respectively, and a control code field; and

each one of said interbus linkage devices coupling the first and second layer serial bus loops including an address register for storing an address of the interbus linkage device on the associated first layer bus loop, means connected to said address register for detecting coincidence between the content of said address register and the content of a predetermined one of the sub-fields of the input-/output address field of the transfer frame received from said associated first layer bus loop, means responsive to detection of coincidence by said detecting means for modifying said received transfer frame by shifting the content of the input/output address field thereof by one sub-field length and means for sending the modified frame to the associated second layer serial bus loop.

4,468,734

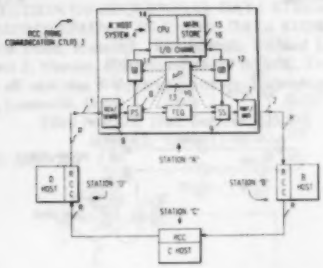
METHOD OF PURGING ERRONEOUS SIGNALS FROM CLOSED RING DATA COMMUNICATION NETWORKS CAPABLE OF REPEATEDLY CIRCULATING SUCH SIGNALS

Charles S. Lanier, Delray Beach; Hiram M. Maxwell; Roger E. McKay, both of Boca Raton, and Leonard Weiss, Hollywood, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,414

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **13 Claims**



1. In a data communication network, including a plurality of data processing stations serially connected in a closed ring by a communication line which conducts information signals originated by said stations unidirectionally through stations successively positioned along said link for receipt by both the originating stations and other stations, said stations communicating on a peer-to-peer basis via said link and being respectively characterizable with respect to any selected station as positioned either upstream or downstream of the selected station depending on whether the direction of a given signal flow along said link is from the respective station to the selected station or from the selected station to the respective station, said stations normally operating relative to said link in a non-synchronous mode wherein each station derives timing references for receiving signals from the link from the respective signals and each station derives timing references for transferring signals to the link from a timing source within the respective station, a method of initializing said network comprising:

at any of said stations, detecting a condition relative to said network requiring initialization of the respective station;

on detecting said condition at a station, performing predetermined bypassing and purging operations in succession at the respective station;

the bypassing operation comprising initializing circuits within the station for operation relative to the link while blocking passage of signals from the link into the station and from the station to the link and also permitting signals to pass along said link so as to provide continuity in the link between stations positioned upstream and downstream of the respective station;

the purging operation comprising interrupting continuity of the link at the respective station, so that signals arriving from upstream station positions on the link are not transferrable to downstream station positions, while transferring predeterined purging signals from the respective station downstream on the link and also trasferring signals into the respective station from upstream station positions on the link; and

maintaining said purging operation for at least a time sufficient to ensure that any transient noise signals, which may have been transferred from the respective station to the link at the transition from said bypassing operation to said purging operation, have been allowed to pass completely around said ring and be trapped at the respective station and thereby purged from the link.

4,468,735

HIGHLY INTEGRATED PROGRAMMABLE LOGIC ARRAY UTILIZING AND AND OR ARRAYS

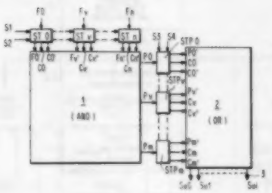
Volkmar Götze, Grafenau, and Günther Potz, Sindelfingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1982, Ser. No. 378,959

Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121562

Int. Cl.³ G06F *7/00*

U.S. Cl. 364—200 **11 Claims**



1. A programmable logic array (PLA) for executing different selectable logic functions determined by corresponding personalization patterns comprising:

a first matrix arrangement forming an AND array having inputs and outputs;

a second matrix arrangement forming an OR array and having inputs coupled to the outputs of said AND array and whose outputs provide the PLA's outputs, the AND and OR array each including a plurality of input and output lines forming crosspoints as well as a plurality of control lines for the activation of a respective one of the selectable logic functions;

coupling elements provided at said crosspoints which depending on their individual personalization selectively provide an electrically conductive path at any one or more crosspoints, said coupling elements being individually formed of a respective field effect transistor having at least two adjacent gas sections associated therewith, the source-drain circuit path of each of said transistor becoming conductive under the condition that a turn-on switching potential is applied to said respectively associated at least two gate sections;

first input control circuits associated with said AND array for providing signals to the inputs of said AND array;

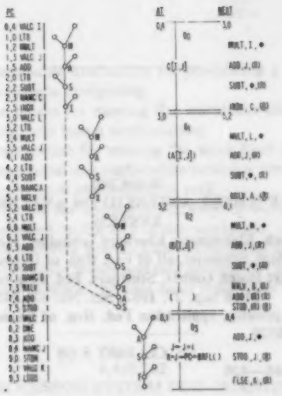
second input control circuits associated with said OR array and responsive to outputs of said AND array for providing signals to inputs of said OR array, said first and second control circuits being adapted to activate coupling elements at crosspoints not being used for a particular function for providing electrically conductive paths while at the same time inactivating the coupling elements formerly used in effecting functional cross-points for disconnecting previously provided electrically conductive paths.

4,468,736

MECHANISM FOR CREATING DEPENDENCY FREE CODE FOR MULTIPLE PROCESSING ELEMENTS

Alfred J. DeSantis, Berwyn, and Joseph S. Schibinger, Phoenixville, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 8, 1982, Ser. No. 386,339
Int. Cl.³ G06F *15/16, 9/06*
U.S. Cl. 364—200 **10 Claims**



1. In a data processing system adapted to execute sequential code, including operators and memory addresses, the combination comprising:

first means to receive said sequential code;

second means for determining when an operator does not require the result of a previous operation thus indicating a logical independency; and

third means for forming strings of logically dependent operators into logically independent queues.

6. In a data processing system adapted to execute sequential code, including operators and memory addresses, the method comprising:

receiving said sequential code;

determining when an operator does not require the result of a previous operation thus indicating a logical independency; and

forming strings of logically independent and subsequent logically dependent operators into logically independent queues.

4,468,737

CIRCUIT FOR EXTENDING A MULTIPLEXED ADDRESS AND DATA BUS TO DISTANT PERIPHERAL DEVICES

Ted R. Bowen, Palatine, Ill., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jun. 9, 1982, Ser. No. 386,497
Int. Cl.³ H04J *3/06*
U.S. Cl. 364—200 **8 Claims**

1. A circuit for extending a multiplexed address/data bus of a central processor to distant co-located peripheral devices for writing to said peripheral devices, said circuit comprising:

CPU means;

a processor clock for producing periodic pulses and being connected to said CPU means;

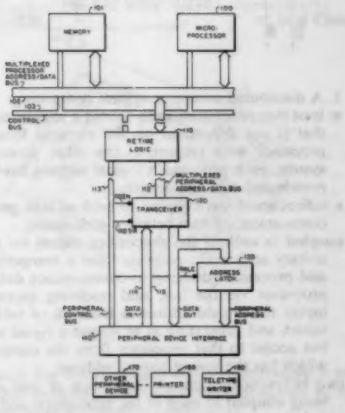
a processor control bus connected to said CPU means;

a multiplexed peripheral device address/data bus being connected to said peripheral devices;

a peripheral device control bus being connected to said peripheral devices;

an address latch connected between said multiplexed address/data bus and said multiplexed peripheral device address/data bus, said address latch operated to receive an address transmitted on said multiplexed address/data bus;

means for receiving, storing and forwarding connected between said multiplexed address/data bus and said peripheral device address/data bus, said means for receiving, storing and forwarding being operated to transfer data bi-directionally between said CPU means and said peripheral devices via said multiplexed peripheral device address/data bus and said multiplexed address/data bus;



first latching means connected to said processor control bus, to said peripheral device control bus and to said address latch, said first latching means being operated in response to a first control signal of said CPU means to delay said first control signal for a predetermined time for deskewing said address of said multiplexed address/data bus;

second latching means connected to said processor control bus to said peripheral device control bus and to said means for receiving, storing and forwarding, said second latching means being operated to delay a second control signal of said CPU means a predetermined time for transmission to said peripheral devices, said second latching means being further operated to control said means for receiving, storing and forwarding by generating a third signal;

said connection between said first and second latching means and said processor control bus including a cable of substantial physical length; and

said first and second latching means connected to said processor clock and being operated in response to said periodic pulses to delay said first and second control signals a minimally sufficient time for resynchronization and retransmission to said peripheral devices.

4,468,738

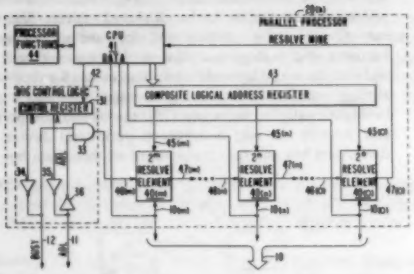
BUS ACCESS ARBITRATION USING UNITARY ARITHMETIC RESOLUTION LOGIC AND UNIQUE LOGICAL ADDRESSES OF COMPETING PROCESSORS

Stanley W. Hansen, Colorado Springs; John D. Terleski, Palmer Lake, and Mark D. Whaley, Colorado Springs, all of Colo., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Continuation of Ser. No. 169,250, Jul. 16, 1980, abandoned. This application Jul. 5, 1983, Ser. No. 512,564

Int. Cl.³ G06F *9/46, 3/04*

U.S. Cl. 364—200 **15 Claims**



1. A distributed computer system comprising:

at least two processors, each having a unique logical address that is not dependent on the physical location of that processor with respect to the other processors in the system, each processor's logical address having the same preselected arbitrary length;

a bidirectional bus coupled to each of said processors, for communicating data between processors;

coupled to each of the processors, means for resolving, in unitary arithmetic, requests from a competing subset of said processors desiring to communicate data to another processor via the bus, said resolving means having as inputs the logical addresses from all of said competing subset, and generating as an output a signal which grants bus access to that processor from the competing subset which has the lowest logical address;

two bidirectional control lines, each of said control lines being coupled to each of the processors; and

coupled to said control lines, means for initiating and terminating the operation of said means for resolving requests.

4,468,739

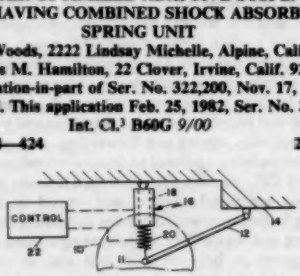
COMPUTER OPTIMIZED ADAPTIVE SUSPENSION SYSTEM HAVING COMBINED SHOCK ABSORBER/AIR SPRING UNIT

Lonnie K. Woods, 2222 Lindsay Michelle, Alpine, Calif. 92071, and James M. Hamilton, 22 Clover, Irvine, Calif. 92714

Continuation-in-part of Ser. No. 322,200, Nov. 17, 1981, abandoned. This application Feb. 25, 1982, Ser. No. 352,239

Int. Cl.³ B60G *9/00*

U.S. Cl. 364—424 **24 Claims**



1. A suspension unit for connecting a sprung portion of a vehicle with an unsprung portion, said suspension unit comprising:

spring means;

shock absorber means comprising a first cylinder, a quantity of hydraulic fluid within said first cylinder, and a first piston dividing said first cylinder into upper and lower chambers;

means operatively connecting said spring means and said shock absorber means;

hydraulic sensor means in communication with said first cylinder for generating first signals representative of the position of said first piston within said first cylinder;

compression pressure regulator means coupled to said upper chamber for adjusting the pressure of the hydraulic fluid in said upper chamber during upward movement of said first piston in response to predetermined second signals applied thereto; and

rebound pressure regulator means coupled to said lower chamber for adjusting the pressure of the hydraulic fluid in said lower chamber during downward movement of said first piston in response to predetermined third signals applied thereto.

4,468,740

VEHICLE WHEEL ANTI-SKID OR ANTI BRAKE-LOCK SYSTEM

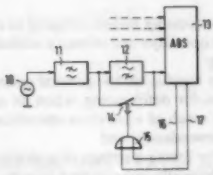
Lothar Beck, Eberdingen; Eberhard Schnaibel, Hemmingen, and Alfred Sigl, Sersheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,241

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1982, 3200529

Int. Cl.³ B60T *8/08*

U.S. Cl. 364—426 **13 Claims**



1. For combination with a vehicle having a wheel, and a brake therefor,

a wheel anti brake-lock or anti-skid system having

a speed sensor (**10**) coupled to a wheel of the vehicle and providing an output signal representative of the speed of rotation of the wheel;

a first filter (**11**) coupled to receive the output signal and providing a filtered signal;

a control unit (**13**);

and comprising, in accordance with the invention,

a second filter (**12**) having different pass characteristics from said first filter;

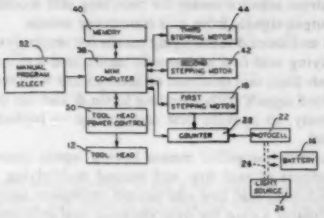
a switch (**14**) selectively connecting said second filter in circuit with the first filter and applying the output from said first filter to said control unit (**13**);

and means (**15, 16, 17**) for generating a control signal, selectively controlling operation of said switch connected to and responsive to a predetermined operating signal occurring within said control unit (**13**).

4,468,741
APPARATUS FOR POSITIONING TOOLING DEVICES RELATIVE TO A BATTERY

Robert D. Simonton, Fremont, Ohio, assignor to Mac Engineering and Equipment Co., Inc., Benton Harbor, Mich.

Continuation-in-part of Ser. No. 178,809, Aug. 18, 1980, abandoned. This application Apr. 10, 1981, Ser. No. 252,920
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 21 Claims



6. A programmable mechanism for positioning a tool head relative to workpiece comprising

a. conveyor means for moving the workpiece along a first dimensional axis into a work station;

b. servomotor means for moving the work head along two other dimensional axis paths while retaining the tool head against movement along the first path;

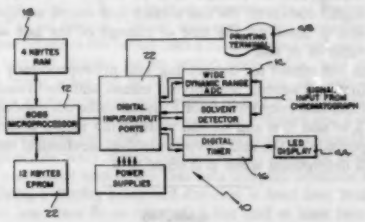
c. storage means for storing a plurality of work location programs based on the size of the workpiece; and

d. means for selecting a work location program for controlling said conveyor means and said servomotor means so as to properly position the tool head relative to the workpiece.

4,468,742
MICROPROCESSOR SYSTEM FOR QUANTITATIVE CHROMATOGRAPHIC DATA ANALYSIS

Donald J. Jenden, Malibu; Robert W. Silverman, Los Angeles, and Frederick C. Lee, South Pasadena, all of Calif., assignors to The Regents of University of California, Berkeley, Calif.

Filed Mar. 17, 1981, Ser. No. 244,761
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—497 23 Claims



1. In the quantitative analysis of a series of samples as to the contents therof in apparatus producing an output signal reflecting the quantity of a component as a peak of substantially Gaussian shape at a fixed time associated with the component, the improved method comprising the steps of:

(a) injecting into the apparatus a standard sample containing a known amount of the compound to be analyzed;

(b) measuring the time to the output of a signal peak associated with the compound to be analyzed to establish the retention time of the apparatus associated therewith;

(c) saving said established retention time;

(d) establishing a data filter by scaling a Gaussian based curve to the curve of said signal peak;

(e) injecting into the apparatus a series of samples containing unknown amounts of said compound to be analyzed;

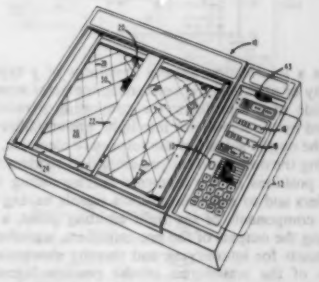
(f) for each sample of said series, sequentially convolving said data filter to the output signal for a sequence of time divisions on either side of and in close proximity to said saved retention time following the injection of said sample to establish a figure of merit reflecting the size of the output signal waveform at its peak to said data filter curve; and,

(g) determining the quantity of component for each of said samples of said series as a function of said figure of merit relative to the known quantity in said standard sample.

4,468,743
NAVIGATIONAL PLOTTING SYSTEM

Thomas J. Dunn, Ocean Bluffs; Donald G. Yuniskis, Jr., Arlington; Gabor L. Szakacs, West Roxbury, and Nghia V. Nguyen, Westwood, all of Mass., assignors to EPSCO, Inc., Westwood, Mass.

Division of Ser. No. 121,651, Feb. 15, 1980, Pat. No. 4,393,448. This application Apr. 26, 1983, Ser. No. 488,674
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—520 6 Claims



1. Apparatus for drawing lines which approximate a true hyperbolic line including a writing implement driven by signals generated from a computer comprising:

means for initializing said computer with a set of coordinates corresponding to an initial START point including means for storing said set of coordinates in said computer, said start point being on the true hyperbolic line to be approximated;

means in said computer for calculating and storing a set of coordinates corresponding to a GOAL on said true hyperbolic line at a distance $2\Delta\mu$ from the coordinates corresponding to said initial START point;

means in said computer for calculating the locus of a straight line between the coordinates corresponding to said initial START point and the coordinates corresponding to said GOAL;

means in said computer for calculating the coordinates of a point between those of said START and GOAL points and for determining the deviation of said straight line from the true hyperbolic line in terms of the shortest distance between said last mentioned point and said straight line;

means responsive to said deviation being below a predetermined limit for providing computer generated signals for drawing straight lines from the coordinates corresponding to said initial START point to the coordinates corresponding to said GOAL, with the ends of each of said last mentioned straight lines lying on said true hyperbolic line;

means including said writing implement and responsive to said computer generated signal for drawing said last mentioned straight lines; and,

means in said computer for calculating the coordinates of the next START point as said GOAL and the coordinates of the next GOAL at a distance in excess of $2\Delta\mu$ from the coordinates of said next START point.

4,468,744

SCINTILLATION CAMERA

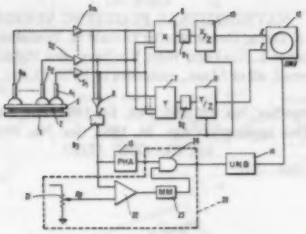
Makoto Kakegawa, Otawara; Mineki Nishikawa, Tochigi, and Tomohiko Kihara, Otawara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 18, 1981, Ser. No. 264,868

Claims priority, application Japan, Jun. 2, 1980, 55-73891

Int. Cl.³ G01T *1/20*

U.S. Cl. 364—527 **2 Claims**



1. In a scintillation camera apparatus of a type having a plurality of photoelectric conversion elements arranged at the back side of a scintillator for converting a radioactive ray received by the scintillator into light, pre-amplifiers for amplifying the output signals of the respective elements, circuits for weighing the outputs of the pre-amplifiers to identify the coordinate positions of the elements corresponding to the pre-amplifiers and to generate position signals having the X- and Y-axis components of the light emitting point, a circuit for summing the outputs of the pre-amplifiers, waveform shortening circuits for intensifying and thereby shortening the time widths of the waveforms of the position signals and the summed output, a peak height analyzer for generating a signal if the peak of the shortened summed output is lower than a predetermined window level, and means for generating coordinate signals for a display device, the coordinate signals being a function of the ratio of the shortened individual position signals and the shortened summed signal if below the predetermined window level, the improvement comprising regulating circuit means for establishing a preset reference value set at a predetermned level within a range between the upper limit of said window level and the saturation level of said pre-amplifiers, means for comparing said summed output with said preset reference value and means for preventing any display on said display device for a predetermined time period after said summed output has exceeded said reference value.

4,468,745

DEVICE FOR POSITION MEASUREMENT

Dag Kjosavik, Sandnes, Norway, assignor to Trallfa Underhaug A/S, Bryne, Norway

PCT No. PCT/NO81/00007, § 371 Date Nov. 23, 1981, § 102(e) Date Nov. 23, 1981, PCT Pub. No. WO81/02780, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 20, 1981, Ser. No. 325,434

Claims priority, application Norway, Mar. 21, 1980, 800827

Int. Cl.³ G01B *7/30*; B25J *19/00*

U.S. Cl. 364—559 **3 Claims**

1. An apparatus for measuring the position of servo controlled mechanical members, such as manipulator members of industrial robots, comprising:

angular position transducer means including a plurality of synchros or resolvers associated with said mechanical members, said transducer means providing first and second modulated a.c. output signals respectively modulated in accordance with the sine and the cosine of an instantaneous angular position θ of said transducer means;

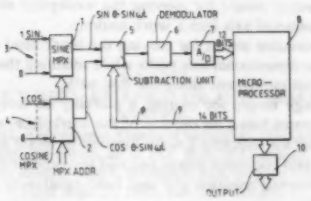
subtraction means for generating a difference signal based on said first and second modulated a.c. output signals from said transducer means, said difference signal representing a difference between θ of said transducer means and ϕ, wherein ϕ denotes a desired corresponding angular position of said transducer means and wherein said subtraction means comprises:

quadrant selector means for receiving said modulated a.c. output signals from said transducer means;

first and second multiplying means for respectively multiplying said first and second modulated a.c. output signals from said quadrant selector means with second and third signals corresponding to sin ϕ and cos ϕ, respectively, to provide first and second multiplied signals; and

differential amplifier means having inputs connected to outputs of said first and second multiplying units for receiving said first and second multiplied signals;

demodulator means for demodulating said difference signal to form a demodulated difference signal;



multiplexing means for alternately connecting said transducer means to said subtraction means, said multiplexing means comprising a first multiplexer receiving from said transducer means said first modulated a.c. output signal and a second multiplexer for receiving from said transducer means said second modulated a.c. output signal;

signal evaluation means for receiving said demodulated difference signal and for transmitting to said subtraction means a signal representative of ϕ, said signal evaluation means comprising an analog to digital converter connected to an output of said demodulator means, and a microprocessor connected to an output of said analog to digital converter for calculating said esired angular position ϕ based on the rate of change of the last sampled value of ϕ; and

data bus means for connecting said microprocessor to said first and second multiplying means and for transmitting from said microprocessor a digital value corresponding to ϕ to said first and second multiplying means wherein the position of the said servo controlled mechanical members is determined when ϕ is equal to θ.

4,468,746

APPARATUS FOR DETERMINING INTERVAL BETWEEN TWO EVENTS

R. M. Davis, West Chester, Ohio, assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

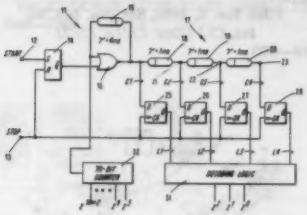
Filed Dec. 1, 1981, Ser. No. 326,390

Int. Cl.³ G04F *8/00*; H03K *5/159*

U.S. Cl. 364—569 **12 Claims**

1. Apparatus for determining the interval between first and second events comprising a clock source started in response to the first event, said source deriving a wave having a first transition when started and equally spaced succeeding transitions spaced from each other by T/2, delay means responsive to the

wave, said delay means having N taps, each deriving a delayed wave having a period T with equal length half cycles, where N is a predetermined integer greater than 1, said taps being spaced from each other so the wave is delayed at tap k by kT/n, where n is a predetermined integer greater than 1 and k is selectively every integer from 1 to N, means responsive to



the delayed wave derived at tap g for deriving a signal indicative of which half cycle of the delayed wave is being derived at tap g when the second event occurs, where g is selectively every integer from 1 to N, and means responsive to the clock source for deriving a signal indicative of whether an even or odd number of clock source transitions occurs between the first and second event.

4,468,747

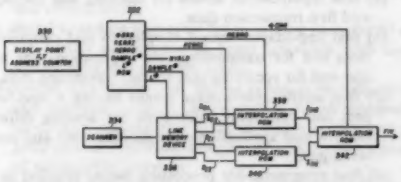
SCAN CONVERTER SYSTEM

Steven C. Leavitt, Hampstead, N.H.; Hugh G. Larsen, West Newbury, Mass., and Barry F. Hunt, Nashua, N.H., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 203,746, Nov. 3, 1980, abandoned. This application Jan. 19, 1982, Ser. No. 340,663

Int. Cl.³ G06F *15/20*; H04N *5/02*

U.S. Cl. 364—577 **3 Claims**



1. Apparatus for deriving from data samples at the intersections of radial lines of a sector with arcs having a spacing s and the same origin as the radial lines a final interpolated data value to be used at display points within said sector, said display points being arranged in rows and columns, the said origin having a given location with respect to said rows and columns, there being a separation K_x between the columns and a separation K_y betwken the rows, an input to which data samples may be applied, memory means coupled to said input for storing at least three radial lines of the said data samples, selection means identifying a display point and deriving at least four data samples, at least two from one radial line and at least two from another radial line, the identified display point and the data samples being related in that the locations of said at least four data samples define an area containing the identified display point, the said apparatus comprising

means for deriving a first intermediate interpolated data value from two of said data samples on one of said radial lines at the intersection of said radial line with a row of display points including the identified display point for which a final interpolated data value is sought,

means for deriving a second intermediate interpolated data value from two of said data samples on said another radial line at the intersection of said another radial line and said row of display points including said identified display point for which a final interpolated data value is sought,

means for deriving a signal representing the angular position of said identified display point with respect to said radial lines, and

means for interpolating said first and second intermediate interpolated data values in response to said signal representing the angular position of said identified display point so as to derive a final interpolated data value at said angular position.

4,468,748

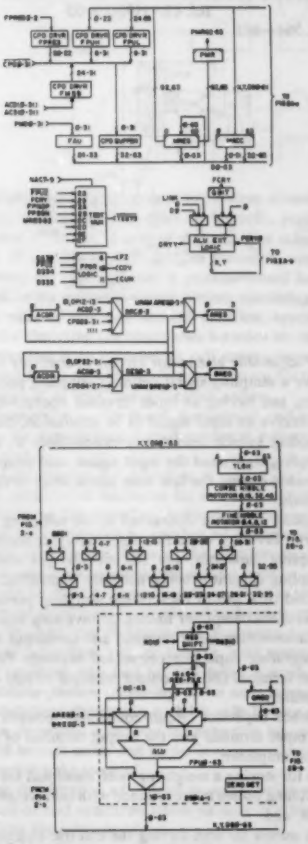
FLOATING POINT COMPUTATION UNIT HAVING MEANS FOR ROUNDING THE FLOATING POINT COMPUTATION RESULT

Jonathan S. Blau, Natick, and Robert W. Beauchamp, Milford, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Jun. 11, 1981, Ser. No. 272,541

Int. Cl.³ G06F *7/48*

U.S. Cl. 364—748 **11 Claims**



1. In a data processing system having a floating point computation unit for providing floating point computation operations, said floating point unit including

mantissa processing means for providing an overall computation result comprising a first plurality of bits representing a desired floating point mantissa computation result

and a second plurality of bits not supplied as part of said desired floating point mantissa computation result;

means for providing a carry-in bit to be added to said floating point mantissa computation result;

means for adding said carry-in bit to the least significant bit of said overall computation result and for causing said carry-in bit to be effectively propagated through said mantissa processing means so as to be added to the least significant bit of said first plurality of bits to form said floating point mantissa computation result.

4,468,749

ADJUSTABLE ATTENUATOR CIRCUIT

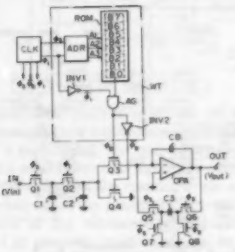
Seiji Kato, Yamato; Norio Ueno, Kawasaki, and Mitsuo Kakuishi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 12, 1981, Ser. No. 292,275

Claims priority, application Japan, Aug. 20, 1980, 55-114478; Aug. 29, 1980, 55-119218

Int. Cl.³ H03G *3/00*

U.S. Cl. 364—861 **10 Claims**



1. An adjustable attenuator circuit operatively connectable to receive a sampling signal defining sampling periods having time slots, and having an input terminal operatively connectable to receive an input signal to be attenuated, comprising:

a sampling switch operatively connectable to receive the sampling signal and the input signal, said sampling switch operated during the first time slot of each of the sampling periods;

a sampling capacitor connected to the sampling switch;

a charge dividing capacitor operatively connected to said sampling capacitor, the electric charges stored in said sampling capacitor being partially transferred during the second time slot of each of the sampling periods;

an operational amplifier having an inverting input terminal, a non-inverting input terminal and an output terminal;

an integrating capacitor connected between the inverting input terminal and the output terminal of said operational amplifier;

a feedback capacitor circuit connected between the inverting input terminal and the output terminal of said operational amplifier;

means for storing a weighting coefficient and for generating switching pulses in accordance with said weighting coefficient; and

switch means for transferring the electric charges stored in said charge dividing capacitor to said integrating capacitor or to discharge said electric charges stored in said charge dividing capacitor in dependence upon said switching pulses from said storing and generating means, said electric charges accumulating on said integrating capacitor, the amount of accumulated charges corresponding to the weighting coefficient.

4,468,750

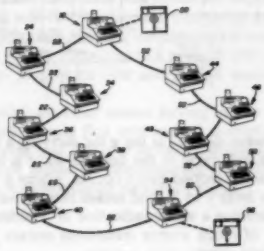
CLUSTERED TERMINALS WITH WRITABLE MICROCODE MEMORIES & REMOVABLE MEDIA FOR APPLICATIONS CODE & TRANSACTIONS DATA

Martin E. Chamoff, and Don W. Piller, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 4, 1980, Ser. No. 109,700

Int. Cl.³ G06F *15/16, 15/21*

U.S. Cl. 364—900 **6 Claims**



1. A clustered system of data-entry terminals, comprising:

(A) a communications link;

(B) a removable, non-volatile storage medium containing a plurality of application-code modules as well as at least first and second transaction data;

(C) a media terminal including

(a) direct-access storage means for removably holding said storage medium and for directly transferring said application-code modules and said transaction data,

(b) first input/output means for entering and displaying said first transaction data,

(c) first line-adapter means coupled to said communications link for transmitting said application-code modules and for receiving said second transaction data,

(d) first addressable storage means having a read/write part and containing microcode for loading different ones of said application-code modules into said read/write part,

(e) first programmable processing means coupled to the above media-terminal elements for executing both said microcode and any of said application-code modules in said addressable storage, and

(f) first enclosure means for housing the above media-terminal elements in a unitary physical package and for providing access to said removable, non-volatile storage medium;

(D) at least one satellite terminal including

(a) second input/output means for entering and displaying said second transaction data,

(b) second line-adapter means coupled to said communications link for transmitting said second transaction data to said media terminal and for receiving said applications-code modules from said media terminal,

(c) second addressable storage means having a read/write part and containing microcode for loading different ones of said application-code modules into said read/write part,

(d) second programmable processing means coupled to the above satellite-terminal elements for executing both said microcode and any of said application-code modules in said addressable storage means, and

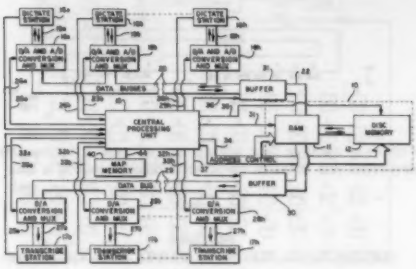
(e) second enclosure means for housing the above satellite-terminal elements in a further unitary physical package.

4,468,751

DICTATION RECORDING AND TRANSCRIBING SYSTEM WITH VARIABLE PLAYBACK SEQUENCE

Luther C. Plunkett, Jr., Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.

Filed May 11, 1981, Ser. No. 262,176
Int. Cl.³ G11B 27/28, 27/22; G06F 3/153
U.S. Cl. 364—900 12 Claims



1. A dictation recorder selectively operable for recording dictation during a recording mode and for playing back recorded dictation during a playback mode, comprising:

an addressable memory array for storing digital signals and jump codes in addressable locations;

an analog to digital converter for providing digital output signals in response to analog dictation input signals during said record mode;

a digital to analog converter for providing reproduced analog signals in response to being provided with digital signals from said memory array;

a control map memory for storing pointing vectors, each of said pointing vectors corresponding to an addressable location in said memory array at which a predetermined jump code is stored and a beginning address of a sequence of addressable locations;

a memory array address controller operative in said record mode for storing said digital output signals in a first sequence of addressable locations of said memory array;

said controller being selectively operable during said record mode for storing a first jump code at a particular address N within said first sequence of addressable locations and for providing a first pointing vector for storing in said control map memory in response to receipt of an insert signal provided by a dictator to indicate an insertion of dictation;

said controller being further responsive to said insert signal during said record mode for storing said digital output signals in a second sequence of addressable locations in said memory array, all addresses of said second sequence of addressable locations being different from all addresses of said first sequence of addressable locations;

said controller being further responsive during said record mode for storing a second jump code at a last address of said second sequence of addressable locations and for providing a second pointing vector for storing in said control map memory in response to receipt of an end of insert signal provided by the dictator to indicate the end of said insertion of dictation,

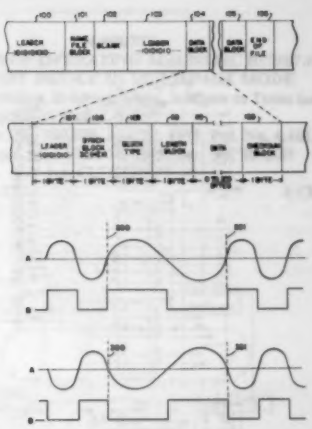
said second pointing vector corresponding to address N+1 in said first sequence of addressable locations.

4,468,752

DATA SYNCHRONIZATION APPARATUS

Dale Chatham, Fort Worth, Tex., assignor to Tandy Corporation

Filed Sep. 21, 1981, Ser. No. 303,942
Int. Cl.³ G06F 3/00; H04L 3/00; G11B 5/06; G08C 25/00
U.S. Cl. 364—900 19 Claims



2. In a digital information processing system wherein digital information is encoded in a series of bit cells, each bit cell having either a first or a second distinct time duration and consisting of a positive pulse and its inversion, said system having means for inserting into a predetermined location in said bit cell series a synchronizing pattern consisting of alternating bit cells of first and second duration, synchronizing apparatus for detecting the boundaries between bit cells in the bit cell series and in an inverted bit cell series comprising,

means responsive to said sychronizing pattern for timing the durations of at least two successive pulses,

means responsive to the timed duration of said successive pulses for determining a predetermined pattern of durations, and

means responsive to the detection of one of said predetermined patterns of durations for selecting positive-going transitions as the boundary between successive bit cells and means responsive to another of said predetermined patterns of durations for selecting negative-going transitions as the boundary between said bit cells.

11. In a digital information processing system wherein digital information is encoded in a series of cells, each cell having one of two distinct time durations and containing a portion of an encoding waveform and its inverse, said system having means for inserting into said bit cell series a predetermined synchronization pattern consisting of bit cells having one of said time durations alternating with bit cells having the other of said time durations, a method for detecting bit cell boundaries in said bit cell series and in the inversion of said bit cell series comprising the steps of:

A. timing the duration of at least two sequential waveform portions of said synchronization pattern, said timing step including the substeps of:

A'. checking the sense of a waveform portion,

A". periodically incrementing a high count if said waveform portion is positive, and

A"'. periodically incrementing a low count if said waveform portion is inverted,

B. detecting predetermined patterns of durations, and

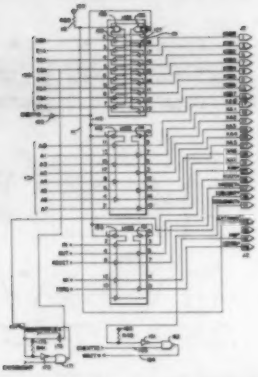
C. locating said bit cell boundaries based on the detection of said patterns.

4,468,753

INPUT/OUTPUT BUFFER CIRCUITRY

Michael F. Berger, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Sep. 21, 1981, Ser. No. 304,173
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 **10 Claims**



4. In a computer system having a memory for storing as program, a central processing unit and at least one peripheral device connected to said central processing unit by means of an input/output bus and an address bus, said peripheral device being capable of sending information to, and receiving information from, said central processing unit over said input/output bus and under control of address signals on said address bus, apparatus for preventing noise present on said input/output bus from affecting operation of said central processing unit comprising,

program means for inserting a predetermined control word into a specified location in said memory,

program means for reading said control word from said specified location into a register,

program means for modifying a predetemined bit of said control word,

program means for storing the modified control word in said specified location,

means connected to selected memory locations including said specific memory location and responsive to said predetermined bit for generating a disable signal only when said predetermined bit is in a predetermined digital state, and

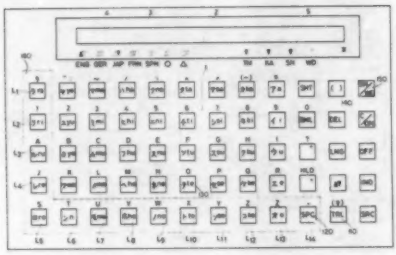
bus transceiver circuitry connected in series with said central processing unit and said input/output bus, said bus transceiver circuitry responsive to data signals generated by said central processing unit to transmit said data signals to said peripheral unit and responsive to data signals generated by said peripheral unit to transmit said data signals to said central processing unit, said bus transceiver circuitry being further responsive to said disable signal for disconnecting said central processing unit from said input-/output bus so that data cannot be transmitted between said central processing unit and said peripheral unit regardless of the presence of address signals on said address bus.

4,468,754

ELECTRONIC TRANSLATOR FOR SELECTING CURSOR POSITION TO INPUT NEW WORDS

Atsushi Asada; Hisao Morinaga, and Mitsuhiro Saiji, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1981, Ser. No. 307,112
Claims priority, application Japan, Sep. 30, 1980, 55-137177
Int. Cl.³ G06F *15/38*
U.S. Cl. 364—900 **10 Claims**



1. An electronic translator comprising:

first memory means for storing a plurality of sentences in a first language;

means associated with said first memory means for retrieving a first sentence from said first memory means;

display means associated with said retrieving means for displaying said retrieved first sentence;

cursor means associated with said display means;

cursor control means for controlling said cursor means for causing said cursor means to pass along said display means without altering a first portion of said first sentence and for causing said cursor means to alter a second portion of said first sentence for creating a second sentence in said first language; and

means associated with said retrieving means and with said display means for providing a translation in a second language of said second sentence in said first language.

4,468,755

DOCUMENT SIZE CONVERSION CIRCUIT FOR A DOCUMENT FILING SYSTEM

Kazuhiko Iida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 30, 1981, Ser. No. 316,911
Claims priority, application Japan, Oct. 31, 1980, 55-153256; Oct. 31, 1980, 55-153268
Int. Cl.³ G06F *3/14*; H04N *1/04*
U.S. Cl. 364—900 **4 Claims**

1. A document size conversion circuit for a document filing system comprising:

an information input terminal to which pieces of line picture information are supplied;

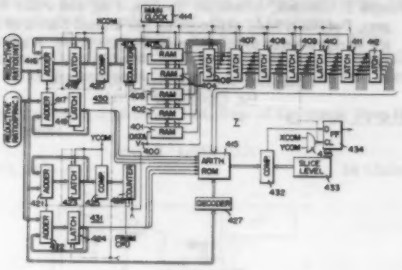
a plurality of memories each adapted to store one of said pieces of line picture information supplied to the terminal;

means for forming a matrix array of local picture information consisting of bits extracted from said plurality of memories;

means for obtaining a picture dot position in said matrix array of local picture information, the picture dot position corresponding to a size conversion rate;

means for obtaining an average gray level of said matrix

array of local picture information with respect to said picture dot position; and



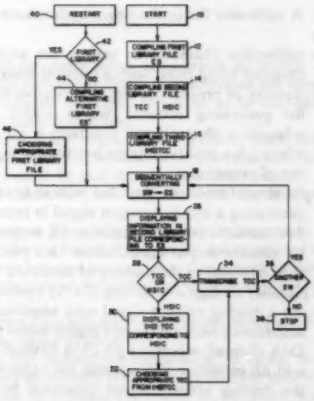
comparator means for comparing said average gray level and a predetermined slice level to form size converted data.

4,468,756

METHOD AND APPARATUS FOR PROCESSING LANGUAGES

Yim F. Chan, Wilmington, Del., assignor to Chan Computer Corporation, Newark, Del.

Filed May 20, 1982, Ser. No. 380,244
Int. Cl.³ G06F *15/38*
U.S. Cl. 364—900 **20 Claims**



1. A method for processing a spokenk language of substantially monosyllabic words corresponding to individual, transcribable character codes of complex configuration, comprising the steps of:

compiling a first, machine-readable library file of encoded signals for each of the words as spoken;

compiling a second, machine-readable library file or those of the character codes uniquely corresponding to one of the spoken words and homonym set identifying codes for groups of those of the character codes corresponding to the same spoken word, for each of the encoded signals in the first library file;

compiling a third, machine-readable library of sets of homonyms for each of the homonym set identifying codes in the second library file;

sequentially converting spoken words into the encoded signals, utilizing the first library file;

sequentially displaying the information in the second library file corresponding to the encoded signal corresponding to the sequentially converted spoken word; and, if the displayed information is one of the homonym set identifying codes,

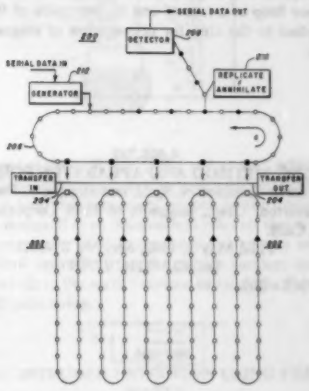
displaying the set of homonyms from the third library file corresponding to the displayed homonym set identifying code, whereby the correct transcribable character code for each spoken word may be easily and quickly identified.

4,468,757

METHOD OF OPERATING MAGNETIC BUBBLE MEMORY DEVICE IN MULTIPAGE MODE

Robert J. Rosenblum, Brighton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 789,390, Apr. 21, 1977, Pat. No. 4,161,788. This application Mar. 16, 1978, Ser. No. 887,157
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—12 **8 Claims**



1. A shift register type memory, comprising;

a plurality of minor loops each of which has a plurality of bits,

a major loop which is large enough to permit data of at least two blocks to simultaneously exist therein when data of one block from said minor loops are constructed of the same number of bits as the number of said minor loops,

means for controlling transfer of the data between said major loop and said minor loops,

means for generating first timing signals for transferring out a plurality of blocks into said major loop sequentially and successively at time intervals shorter than a period of time required for the data to travel round said major loop, and

means for generating a second timing signal for transferring in the data having been already transferred out to said major loop by said first timing signal, to predetermined positions within said minor loops at a point of time between timings of the successive transfer-out operations.

4,468,758

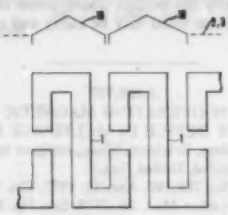
MAGNETIC BUBBLE MEMORY CHIP

Minoru Hiroshima, Mobara; Kohzo Hara, Musashino; Ryo Suzuki, Kodaira, and Masatoshi Takeshita, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 17, 1982, Ser. No. 378,744
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **1 Claim**

1. A magnetic bubble memory chip comprising folded minor loops for storing magnetic bubble information, and input and output tracks for transferring the magnetic bubble information into and out of said minor loops, said input and output tracks

having a pattern repetition period that is four or more times as large as a fundamental period of each of said minor loops in order to propagate one bit information from one propagation element of said input and output tracks, associated with one



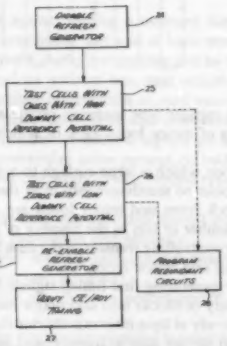
minor loop, to a next propagation element associated with a next minor loop at a rate of one bit per cycle of the rotating field applied to the chip for propagation of magnetic bubble domains.

4,468,759

TESTING METHOD AND APPARATUS FOR DRAM

Roger I. Kung; Jonathan N. Spitz, and Stephen T. Flannagan, all of Beaverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed May 3, 1982, Ser. No. 374,622
Int. Cl.³ G11C *17/00*
U.S. Cl. 365—201 **11 Claims**


DOUBLE REFRESH GENERATOR
TEST CELLS WITH CHARGE WITH ARRAY DUMMY CELL REFERENCE POTENTIAL
TEST CELLS WITH ZEROS WITH ARRAY DUMMY CELL REFERENCE POTENTIAL
RE-ENABLE REFRESH GENERATOR
PROGRAM REDUNDANT CIRCUITS
VERIFY CE/ROY TIMING

4. In a metal-oxide-semiconductor, dynamic, random-access memory employing first and second bit lines coupled to a sense amplifier, where each of said bit lines is coupled to a plurality of capacitance storage memory cells, and where a predetermined potential is applied to one of said first and second bit lines during normal memory operation when data is accessed along the other of said first and second bit lines; an improved method for testing said memory comprising:

applying a potential different than said predetermined potential to said one bit line;

accessing data during said testing from memory cells coupled to said other bit line to determine if said accessed data is the same as data stored in said memory cells thereby determining if said memory can operate with said different potential;

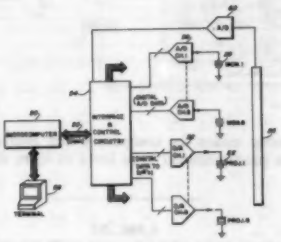
whereby said memory is tested so as to predict said memory's performance under stressful environmental conditions.

4,468,760

DIRECTIONAL LINE-HYDROPHONE ARRAY CALIBRATOR

Joseph F. Zalesak, Altamonte Springs, Fla., and Peter H. Rogers, Potomac, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1982, Ser. No. 393,246
Int. Cl.³ H04R *29/00*
U.S. Cl. 367—13 **9 Claims**



1. A calibrator for calibrating a hydrophone array comprising:

a calibration chamber for sealing the array therein, said chamber being filled with a selected fluid;

a plurality of projectors, disposed relative to said chamber, for generating acoustic waves within said chamber, wherein a jth projector generates a jth acoustic wave, where j is a positive integer less than or equal to the number of projectors;

a plurality of monitors, disposed relative to said chamber, for generating a monitor output signal in response to an incident acoustic wave, wherein an ith monitor generates an ith monitor output signal, where i is a positive integer less than or equal to the number of monitors;

a plurality of digital-to-analog (D/A) channels for generating a driving voltage signal with amplitude and phase in accordance with a projector digital signal received by said D/A channel, wherein a jth D/A channel is connected to said jth projector and wherein the complex amplitude of the driving voltage signal generated by said jth D/A channel is V_{fj}.

a plurality of monitor analog-to-digital (A/D) channels for encoding the amplitude and phase of said monitor output signal into a monitor digital signal, wherein an ith A/D channel is connected to said ith monitor;

an array A/D channel for encoding the amplitude and phase of the output signal of the array under test into an array digital signal;

digital computer means wherein the inputs to said digital computer means are said monitor digital signals and said array digital signal and the outputs from said digital computer means are said projector digital signals, said digital computer for calculating a set of V_{fj} so that a calibration wave, with a predetermined amplitude and phase relative to the center of the array, corresponding to a free plane wave incident on the array at any arbitrary angle θ is generated in said chamber, for encoding said set of V_{fj} to said jth D/A channel and for storing said array digital signal resulting from said calibration wave.

4,468,761
NOISE SUPPRESSION METHOD

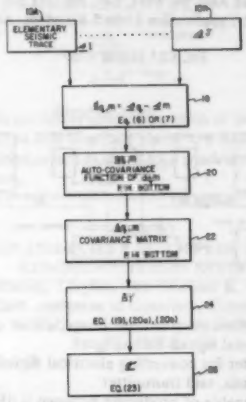
Eike Rietsch, Houston, Tex., assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 936,677, Aug. 24, 1978, abandoned, which is a continuation-in-part of Ser. No. 864,712, Dec. 27, 1977, abandoned. This application May 20, 1981, Ser. No. 265,262

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658954

Int. Cl.³ G01V 1/36

U.S. Cl. 367—43 14 Claims



1. A method for suppressing noise trains in seismic data representative of detected multiple seismic events and noise by a plurality of seismic detection means so as to provide enhanced seismic data, comprising

(a) deriving elementary seismic traces data for each seismic detection means from the seismic data representative of detected seismic events by said seismic detection means,

(b) deriving elementary seismograms from the elementary siesmic trace,

(c) combining at least two elementary seismograms in a manner to derive noise seismograms, the number of noise seismograms being at least equal to the number of elementary seismograms to be combined to form a final seismogram,

(d) determining the probability distribution of noise for each trace of the noise seismogram,

determining the probability distribution of noise in said traces of the elementary seismograms from the probability distributions of noise in the traces of the noise seismograms; and

(f) providing the enhanced seismic data from the seismic data in accordance with the probability distribution of step (e).

4,468,762
TELEMETRY EQUIPMENT IN MODULES

Rainer Jürgens, Altencelle, Fed. Rep. of Germany, assignor to Christensen, Inc., Salt Lake City, Utah

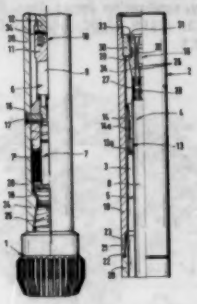
Filed Aug. 3, 1981, Ser. No. 289,332

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1980, 3035905

Int. Cl.³ G01V 1/40

U.S. Cl. 367—83 8 Claims

1. Apparatus for the remote transmission of information from a drill hole to the earth's surface during the operation of a drilling appliance which comprises a rotary drilling bit, a drill pipe string and a pump which delivers drilling fluid downwards in the flow channel of the drill pipe string, through the rotary drilling bit and upwards in the drill hole annular space surrounding the drill pipe string, the apparatus consisting of means in the drill pipe string for the detection of desired information data; for the conversion of the information data into a succession of electrical control signals, for the generation of pressure pulses in the downwardly directed flow of the drilling fluid in dependence on the control signals and for the generation of the required electric energy, said means forming part of a constructional unit, which is coaxially supported inside the



flow channel of the drill pipe string and around which drilling fluid can flow, and are grouped in superimposed separate axial sections, at least the uppermost section of the constructional unit being designed as an independent sub unit that is separable from the remainder of the constructional unit by means of a catching tool operable from the earth's surface, and can be pulled upwards to the earth's surface through the flow channel of the drill pipe string.

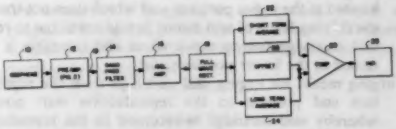
4,468,763
SEISMIC INTRUDER DETECTION USING PRESSURE WAVES

Russell D. Brauning, Eden Prairie, and Dennis L. Kurschner, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 6, 1983, Ser. No. 492,112

Int. Cl.³ H04B 1/06

U.S. Cl. 367—136 3 Claims



1. In combination:

a geophone responsive to pressure waves and having a resonant frequency and a response that decreases with frequency below said resonant frequency;

amplifying means connected to said geophone and having a gain which is substantially constant for frequencies above the resonant frequency, and which varies inversely with frequency, for frequencies below the resonant frequency, at about 12 decibels per octave;

a band-pass filter connected to said amplifying means and having cut-off frequencies of about 5 Hertz and 12 Hertz;

single channel rectifying means connected to said band-pass filter;

means connected to the rectifying means for obtaining short term and long term averages of the output of said rectifier;

and means including a comparator connected to the last named means for giving an output when the short term

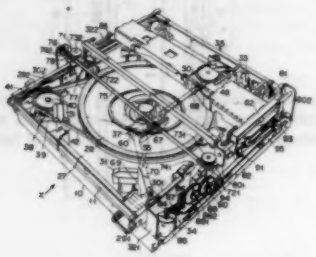
average exceeds the long term average by more than a predetermined amount.

4,468,764

DISC REPRODUCING APPARATUS

Akira Fukumitsu, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 27, 1982, Ser. No. 423,724
Claims priority, application Japan, Dec. 17, 1981, 56-202425
Int. Cl.³ G11B *21/02, 9/06, 23/04, 3/36*
U.S. Cl. 369—77.2 **3 Claims**



1. A disc reproducing apparatus into which a disc is inserted by insertion of a casing housing the disc therein and from which the disc is removed by insertion of an empty casing thereinto,

said disc reproducing apparatus comprising:

a housing;

a turntable which is vertically movable in said housing;

turntable driving means for moving said turntable to an upper position in a reproducing condition and for moving said turntable to a lower position in a nonreproducing condition;

a cartridge which has a stylus for picking up signals recorded on said disc in the reproducing condition and which is movable between a reproduction start position and a reproduction end position;

cartridge driving means, with a motor, for driving said cartridge from the reproduction start position toward the reproduction end position, said cartridge driving means including a clutch means which transmits the driving force of said motor to said cartridge when said turntable is located at the upper position, and which does not transmit the driving force of said motor to said cartridge to render said cartridge free to move when said turntable is positioned at the lower position; and

urging means for urging said cartridge from the reproduction end position to the reproduction start position, whereby said cartridge is returned to the reproduction start position by the urging means when the turntable is positioned at the lower position, and wherein said clutch mechanism includes:

(a) a first pulley which is positioned at a fixed position and which is rotated by said motor;

(b) a regulating plate which is movable between a first position and a second position;

(c) a second pulley rotatably mounted on said regulating plate;

(d) an endless transmission member which is stretched between said first and second pulleys and part of which is fixed to said cartridge; and

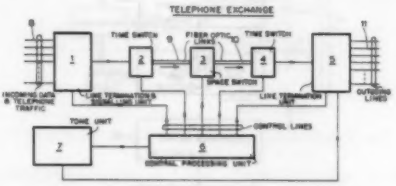
(e) a control mechanism which moves said regulating plate to the first position at which said transmission member is kept tense to allow the movement of said cartridge through said transmission member upon rotation of said first pulley, when said turntable is located at the upper position, and which moves said regulating plate to the second position at which said transmission member is not tense to prohibit transmission of a rotational force of said first pulley to said cartridge through said transmission member, when said turntable is located at the lower position.

4,468,765

ELECTRONIC TELEPHONE EXCHANGES AND OPTICAL FIBER LINKS FOR USE THEREIN

Paul C. Hensel, and Raymond C. Hooper, both of Suffolk, England, assignors to British Telecommunications, London, England

Filed Aug. 10, 1981, Ser. No. 291,505
Claims priority, application United Kingdom, Aug. 18, 1980, 8026906
Int. Cl.³ H04B *9/00*
U.S. Cl. 370—1 **17 Claims**



1. In an electronic telephone exchange, a fiber optic link for transmitting digital signals including:

(a) a transmitter for converting electrical digital signals into optical signals, said transmitter

(i) being capable of producing between 0 dBm and −30 dBm of launch power, and

(ii) having an extinction ratio of between 0 and 0.3;

(b) a receiver for converting said optical signals into electrical signals, said receiver having

(i) a sensitivity in the range −40 dBm to −15 dBm

(ii) a dynamic range between 10 dB and 20 dB, and

(iii) a power consumption of less than 100 mW; and

(c) an optical fiber linking said receiver and said transmitter, said fiber

(i) being a multi-mode, optical fiber

(ii) having an outside cladding diameter of 180–250 microns

(iii) having a core diameter of 0.6 to 0.95 of the cladding diameter, and

(iv) having a numerical aperture in the range 0.2–0.5.

4,468,766

OPTICAL RF DOWNCONVERTER

Anthony Spezio, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 431,981
Int. Cl.³ H04B *9/00*
U.S. Cl. 370—3 **13 Claims**

9. A wideband optical frequency converter comprising:

a signal input line for providing a signal to be frequency converted;

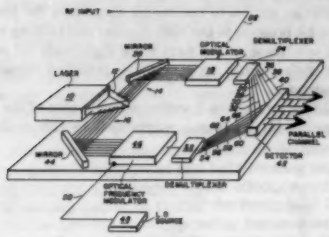
means for modulating an optical carrier with the signal on said signal input line:

optical detecting means including a plurality of detecting elements for providing a plurality of output signal channels;

first means for spatially separating different sections of the frequency spectrum produced by the modulation of the optical carrier into a plurality of spatially separated optical channels, with each channel directed to a different detecting element in said optical detecting means; and

means for providing a different optical localoscillator signal with a different frequency to each of said different detect-

ing elements, each of said different optical local oscillator signals being phase-coherent with said optical carrier and at an appropriate frequency such that when it is mixed with the particular spectrum section of the optical channel directed to that detecting element, a difference frequency is obtained which is equal to a predetermined difference frequency.

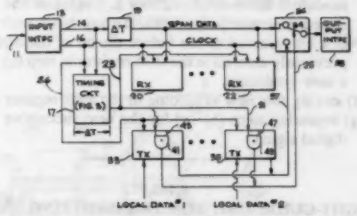


4,468,767

DROP-AND-INSERT MULTIPLEX DIGITAL COMMUNICATIONS SYSTEM

Toney C. Warren, Clayton, and Michael E. Hance, Concord, both of Calif., assignors to Coastcom, Concord, Calif.

Filed Dec. 7, 1981, Ser. No. 328,316
Int. Cl.³ H04J *3/08*
U.S. Cl. 370—55 10 Claims



1. A digital communications unit for use between spans in a serial data communications link comprising,

data input and output means connected to spans in a communications link carrying a multiplex digital, multi-channel, serial, data stream, each channel having a fixed time duration in a data frame, each frame marked by framing bits, the data characterized by a data frequency, said input means extracting clock pulses from the data,

a data switch connected between the data input and output means, said switch normally connecting the data input means to said output means, said switch having a selector for selecting data from the data input means or from a local transmit channel,

circuit means connected to said data input means for generating channel strobe pulses by counting clock pulses, with reference to the framing bits, said channel strobe pulses having a pulse width corresponding to the duration of a channel, preselected strobe pulses being transmitted to the switch,

a local transmit channel connected to the selector and to the timing circuit means, the channel being inserted in the data stream in response to a preselected strobe pulse through the data switch whereby said inserted local transmit channel replaces any data in said communications link during said preselected strobe pulse, and

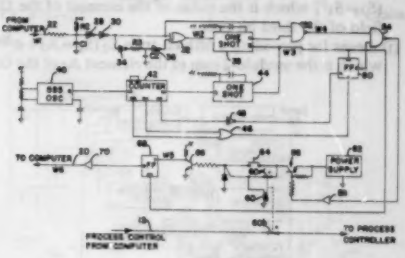
a delay means interposed between the data input means and the switch for synchronizing serial data of the data stream with the channel strobe pulses.

4,468,768

SELF-TESTING COMPUTER MONITOR

Thomas H. Sunkle, Newark, and John M. Cox, Pataskala, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 315,316, Oct. 26, 1981, abandoned. This application Aug. 17, 1983, Ser. No. 523,903
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—16 19 Claims



1. A self-testing computer monitor for receiving a signal from a computer which toggles at a preselected first frequency, said monitor comprising:

(a) clock means adapted to receive a first frequency signal from a computer for producing periodic timing pulses;

(b) test circuit means adapted to receive said periodic timing pulses for generating periodic test pulses;

(c) bistable means adapted to receive said periodic timing pulses and adapted to receive said periodic test pulses for generating a second frequency in response to said timing pulses and said test pulses;

(d) means adapted to receive said periodic test pulses and to compare said test pulses with the output of an oscillator for sensing if said preselected first frequency of said computer is toggling at a frequency outside a predetermined range of frequencies; and

(e) means interconnecting said means for sensing and said bistable means for preventing one of said test pulses and said timing pulses from being coupled to said bistable means in response to said sensing means sensing that said first frequency is toggling at a frequency outside said range, whereby the generation of said second frequency by said bistable means indicates that the computer and the monitor have not failed.

4,468,769

ERROR CORRECTING SYSTEM FOR CORRECTING TWO OR THREE SIMULTANEOUS ERRORS IN A CODE

Kelichiro Koga, Urawa, Japan, assignor to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 349,319
Claims priority, application Japan, Feb. 18, 1981, 56-21408; Jul. 22, 1981, 56-113617
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 3 Claims

1. An error correction system for correcting two simultaneous errors comprising:

(a) an input terminal for receiving a code signal,

(b) a data buffer for storing said code signal,

(c) a first syndrome generation circuit for providing the first syndrome A_1 from the code signal at the input terminal,

(d) a second syndrome generation circuit for providing the second syndrome A_2 from the code signal at the input terminal.

(e) a correction inhibit circuit for detecting the condition that all the bit positions in said first syndrome A_1 are zero,

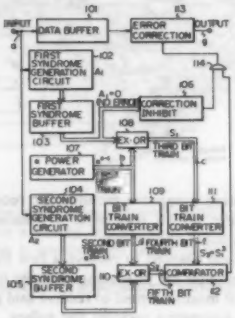
(f) means for providing a first bit train which shows an element α^{n-t} of a Galois field for each bit position in a code signal where n is a code length and t is an integer not larger than n for indicating a test bit,

(g) means for providing a second bit train ($\alpha^{3(n-t)}$) which is the cubic of the first bit train (α^{n-t}),

(h) means for providing a third bit train S_1 which is the modulo-2 sum of the element (A_1) of the Galois field of the first syndrome and the element (α^{n-t}) of the Galois field of the first bit train ($S_1=A_1+\alpha^{n-t}$),

(i) means for providing a fourth bit train S_3 wherein ($S_3=S_1^3$) which is the cubic of the element of the Galois field of the third bit train,

(j) means for providing a fifth bit train S_2 ($S_2=A_2+\alpha^{3(n-t)}$) which is the modulo-2 sum of the element A_2 of the Galois



field of the second syndrome and the element ($\alpha^{3(n-t)}$) of the Galois field of the second bit train, said means for providing a third bit train S_1, and said means for providing a fifth bit train S_2 are composed of an exclusive-OR circuit,

(k) a comparator for comparing an element of the Galois field of the fourth bit train with an element of the Galois field of the fifth bit train,

(l) a gate circuit for preventing the coincident output of said comparator when the output of said correction inhibit circuit is zero so that said output of the comparator is prevented when all the bit positions of said first syndrome A_1 are zero,

(m) an error correction circuit for inverting an output of said data buffer when an output of said gate circuit is positive, and

(n) an output terminal coupled with said error correction circuit for providing a corrected code signal.

4,468,770

DATA RECEIVERS INCORPORATING ERROR CODE DETECTION AND DECODING

Eric Metcalf, Alresford, and Michael C. Jeffery, Fleet, both of England, assignors to Sangamo Weston Limited, Enfield, England

Filed Feb. 24, 1982, Ser. No. 351,793

Claims priority, application United Kingdom, Mar. 3, 1981, 8106677

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—42 **2 Claims**

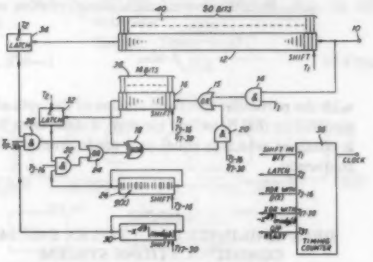
1. A method for iteratively decoding respective syndromes for groups of m bits of a multi-bit digital signal, each group starting one bit later in the signal than the previous group, the digital signal being arranged in the form of successive blocks each of m bits, each block including at least a first series of bits comprising a data word and a second series of bits comprising a check word, the check word being derived from the data word and a predetermined n-bit generator polynomial for providing an error correction code, comprising the steps of:

(a) storing an initial predetermined syndrome in a shift register;

(b) receiving a bit of the digital signal;

(c) entering the bit of the digital signal into the least significant bit position in the shift register and shifting each bit of the syndrome to the next more significant bit position in the shift register to produce a modified version of the syndrome;

(d) adding by modulo-2 arithmetic the value of the predetermined n-bit generator polynomial to the modified syn-



drome produced in step (c), in accordance with the value of the most significant bit thereof, to produce a partial new syndrome;

(e) adding by modulo-2 arithmetic to the partial new syndrome produced in step (d) the value of the remainder of modulo-2 division of -2^m by the value of the predetermined generator polynomial, in accordance with the value of a bit received m bits before the bit of the digital signal previously entered in the shift register in step (c), to derive a new syndrome;

(f) storing this new syndrome in the shift register; and

(g) repeating steps (b)–(g) for the next successive bit of the digital signal.

4,468,771

LIGHT-GUIDE UNIT FOR TRANSMITTING THERMAL RADIATION FROM MOLTEN METAL TO PYROMETER

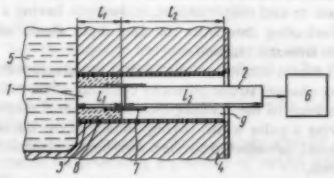
Leonid F. Zhukov; Evgeny G. Chuguny, and Vladimir S. Shumikhin, all of Kiev, U.S.S.R., ~~assignors~~ to Institut Problem Litya Akademii Nauk Ukrainskoi SSR, U.S.S.R.

PCT No. PCT/SU80/00143, § 371 Date Apr. 19, 1982, § 102(e) Date Apr. 19, 1982, PCT Pub. No. WO82/00712, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 22, 1980, Ser. No. 373,490

Int. Cl.³ G01K *1/12, 5/08*

U.S. Cl. 374—131 **8 Claims**



1. A light-guide unit for transmitting thermal radiation from a melt of a metallurgical vessel to a pyrometer comprising: a light-forming rod composed of a light-permeable refractory corrosion-resistant material and having a first end exposed to said melt; a light-transmitting rod composed of a light-permea-

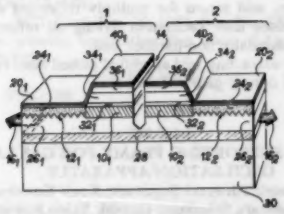
ble refractory corrosion-resistant material and arranged coaxially with said light-forming rod, said light-transmitting rod having a first end spaced by a preselected gap from a second end of said light-forming rod and a second end mounted near said pyrometer; a ceramic tube in which said light-forming rod and said light-transmitting rod are coaxially arranged and located in a lining of said metallurgical vessel; a flexible protection sleeve connecting the spaced ends of said light-forming rod and said light-transmitting rod and composed of a material featuring plasticity at an operating temperature of said lining; a first refractory material having a sintering temerature not exceeding the sintering temperature of the lining, a linear expansion coefficient of said first refractory material substantially coinciding at the sintering temperature of the lining with the linear expansion coefficient of said light-forming and light-transmitting rods and a resistance to the effect caused of the products of melting similar to that of the lining, said first refractory material forming at the operating temperature of the lining a viscous mass not fusing together with said light-forming rod, said first refractory material being disposed in a space defined between said light-forming rod and said tube; and a second refractory material having a sintering temperature exceeding both the operating temperature and the sintering temperature of the lining and disposed in a space defined between said light-transmitting rod and said tube; wherein the length of said light-forming rod is equal to the thickness of a metallized layer of said lining and the length of said light-transmitting rod is equal to the thickness of a remaining portion of said lining.

4,468,772

BISTABLE OPTICAL DEVICE

Jean-Louis Oudar, 27, Avenue du Plessis, 92290 Chatenay-Malabry, France

Filed Apr. 15, 1982, Ser. No. 368,528
Int. Cl.³ H01E 3/19
U.S. Cl. 372—8 **5 Claims**



1. A bistable optical device having two active states comprising:

(a) a first semiconductor laser heterostructure comprising first resonating means and a first amplifying medium, said resonating means being tuned to oscillate and emit light of a first predetermined and characteristic frequency and being disposed adjacent said first amplifying medium;

(b) a second semiconductor laser heterostructure comprising second resonating means and a second amplifying medium, said resonating means being tuned to oscillate and emit light of a second predetermined and characteristic frequency and being disposed adjacent said second amplifying medium, said second predetermined frequency being different and logically distinguishable from said first predetermined frequency;

(c) electrode means for introducing power to said amplifying media;

(d) means for supporting said first and second laser heterostructures; and

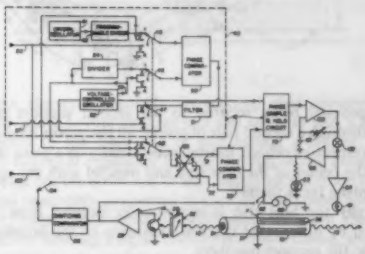
(e) means for optically coupling said laser heterostructures so that light of said first characteristic frequency from said first laser heterostructure communicates with said second amplifying medium of said second laser heterostructure and light of said second characteristic frequency from said second laser heterostructure communicates with said first amplifying medium, said first characteristic frequency being within the amplifying range of said first and said second amplifying medium and said second characteristic frequency being within the amplifying range of said first and said second amplifying media.

4,468,773

LASER CONTROL APPARATUS AND METHOD

Norman T. Seaton, 2821 9th St., Berkeley, Calif. 94710

Filed May 29, 1981, Ser. No. 268,399
Int. Cl.³ H01S 3/13
U.S. Cl. 372—32 **8 Claims**



1. A frequency control apparatus for controlling the frequency of light output of a single laser having output radiation in two or more modes, said modes producing an intermodal beat frequency, and electric signal responsive first means for controlling the laser resonant cavity length and thereby said frequency of output from said laser, comprising:

second means for receiving said receiving said radiation in a fixed plane of polarization for detecting said intermodal beat frequency and conversion thereof into a first electric signal having a frequency as a function of said beat frequency;

third means for providing a reference frequency second electric signal;

phase comparator fourth means having a first input terminal connected to said second means for receiving said first signal as one input thereof, and having a second input terminal connected to said third means for receiving said second signal as a second input thereof;

said phase comparator fourth means having an output providing an electric third signal varying as a function of the phase difference between said first and second signals and beign connected to said first means for phase locking said first and second signals.

4,468,774

FACE PUMPED LASER HOST MOUNTING

Alexander G. Robbins, Vestal, N.Y., assignor to General Electric Company, Burlington, Vt.

Filed Dec. 10, 1981, Ser. No. 329,214
Int. Cl.³ H01S 3/05
U.S. Cl. 372—34 **10 Claims**

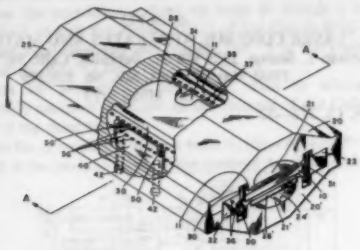
1. In a face-pumped laser of the type including an elongated homogeneous slab of active laser host having a pair of optically plane faces extending substantially parallel to one another for receiving radiation for effecting optical pumping of the host, the slab also having a pair of parallel sides; and a hollow housing for receiving therein the host slab; means for fixedly mounting the host slab within the housing, comprising:

first and second elongated support members, each being

approximately coextensive with the host slab for supporting therebetween the host slab at its parallel sides;

means for bonding the parallel sides of the host slab to the respective support members; and

first and second pedestals, each fixedly secured to the housing, the first pedestal being secured to the first support member through a first pair of pivots and the second



pedestal being secured to the second support member through a second pair of pivots, all the pivots having their respective centers located substantially on a plane through the center of the host slab and parallel with the optically plane faces thereof;

whereby the host slab is substantially isolated from flexing caused by differential thermal expansion of the housing relative to the support members.

4,468,775

OPTICAL SELECTOR DEVICE USING A FIZEAU WEDGE FOR REFLECTION

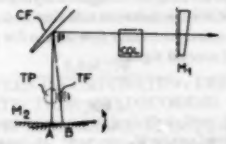
Yves H. Meyer, Bures S. Yvette, France, and Marin N. Nentchev, Sofia, Bulgaria, assignors to Centre National de la Recherche Scientifique, Paris, France and Institut Po Electronica PRI Ban Sofia, Sofia, Bulgaria

Filed Oct. 9, 1981, Ser. No. 310,335

Claims priority, application France, Oct. 9, 1980, 80 21621

Int. Cl.³ H01S *3/08*

U.S. Cl. 372—92 **19 Claims**



1. An optical device of the Fizeau wedge type having two partial reflection surfaces for reflecting a beam of light and defining a reflecting Fizeau wedge, said partial reflecting surfaces being oriented at a small angle with respect to each other such that the distance from one surface to the other surface varies progressively, the reflectivity R of each of said surfaces being greater than 0.6, while the absorptive power of said surfaces is low, thereby enabling said reflecting Fizeau wedge to produce a selective feedback of components of said beam of light.

4,468,776

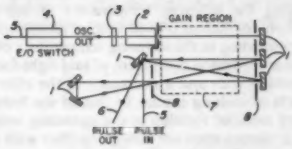
REINJECTION LASER OSCILLATOR AND METHOD

Edward J. McLellan, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 20, 1981, Ser. No. 294,601

Int. Cl.³ H01S *3/081*

U.S. Cl. 372—93 **11 Claims**



1. A high intensity, subnanosecond pulse duration reinjection laser comprising in combination:

a. means for producing a large area cross-section optical gain volume;

b. means for generating a beam of pulsed laser oscillation in said optical gain volume;

c. means for selectively switching a short temporal segment out of said beam of pulsed laser oscillation in said optical gain volume;

d. means for reinjecting said selectively switched temporal segment into said optical gain volume to but displaced from the path of;

e. means for multiply reflecting said reinjected temporal segment of said pulsed laser oscillation through said optical gain volume a selected number of times along a compact path disposed approximately parallel to and displaced from the path of said beam of laser oscillation, thereby achieving amplification of said reinjected pulsed laser oscillation, said means for multiply reflecting said reinjected pulsed laser oscillation having all reflecting surfaces substantially non-parallel; and

f. means for extracting said amplified pulsed laser oscillation from said optical gain volume.

4,468,777

MIRROR SUPPORTING FRAME FOR GAS LASER OSCILLATION APPARATUS

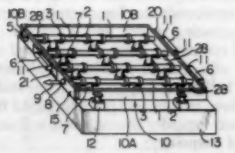
Satoshi Takemori; Hiroyuki Sugawara; Kouji Kuwabara, all of Hitachi; Toshiharu Shirakura, Ibaraki; Yukio Kuwakubo, and Kouji Sasaki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 308,120

Claims priority, application Japan, Oct. 8, 1980, 55/139802

Int. Cl.³ H01S *3/08*

U.S. Cl. 372—107 **12 Claims**



1. A gas laser oscillation apparatus including a laser resonator in which a total reflection mirror and an output mirror are respectively provided at both ends of a laser tube connection body, a hollow block member provided with a pair of mirror means for bending a laser beam, and a supporting frame means for receiving said laser resonator and for supporting said total

reflection mirror and said output mirror, the apparatus comprising:

a first holding plate means for holding said total reflection mirror and said output mirror, a second holding plate means for holding said hollow block member, meas for attaching said second holding plate means to said supporting frame means, at least a first pair of fastening means for attaching said first holding plate means to said supporting frame means with an air gap formed between said first holding plate means and said supporting frame means, at least a second pair of fastening means for attaching said first holding plate means to said supporting frame means, said first pair of fastening means being arranged on a straight line, said second pair of fastening means being arranged on a straight line, said supporting frame means being subjected to the same deformation along said straight lines, a center of said total reflection mirror and a center of said output mirror respectively lying on said straight lines, and said first and second pairs of said fastening means are arranged symmetrically with respect to said respective centers of said total reflection mirror and said output mirror.

4,468,778

WAVE GUIDE LASER WITH FRUSTRATION ELEMENT

Heinrich Karning, Alb.-Fritz-Str. 6, 6900 Heidelberg, and Franz Prein, Tulpenweg 3, 6901 Waldhilsbach, both of Fed. Rep. of Germany

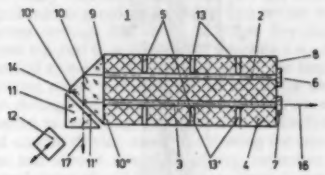
PCT No. PCT/DE81/00020, § 371 Date Dec. 4, 1981, § 102(e) Date Dec. 4, 1981, PCT Pub. No. WO81/02953, PCT Pub. Date Oct. 15, 1981

PCT Filed Jan. 24, 1981, Ser. No. 329,268

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013302

Int. Cl.³ H01S *3/10*

U.S. Cl. 372—108 11 Claims



1. In a modulated laser system comprising a first waveguide having first and second endfaces, a frustration element, and a first and second optical element, wherein, said first optical element is totally reflecting; a first beam path traverses said first waveguide; said first waveguide is defined adjacent said first endface by said first optical element and is defined adjacent said second endface by said frustration element; and said frustration element comprises first and second optically refracting parts movably positioned adjacent to each other with a gap of variable width between said first and second refracting parts, and transducer means for supporting said first and second parts in physical positions with respect to each other in response to modulation information, said first part being configured and dimensioned to fold a beam exiting along said first beam path by internal reflection in said first path onto said second optical element if said first and second parts are not in contact and said beam is coupled out by said second part if said first and second parts are in contact.

4,468,779

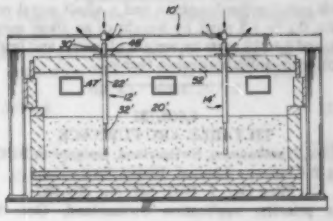
ELECTRODE ASSEMBLY FOR MELTING GLASS

Dale C. Gillman, Kent, Wash., assignor to CRI Engineering, Inc., Tukwila, Wash.

Filed Dec. 6, 1982, Ser. No. 446,848

Int. Cl.³ C03B *5/027*; H05B *3/03*

U.S. Cl. 373—36 12 Claims



1. An electrode assembly for melting glass comprising a hollow casing having an inner end and an outer end, a holder connected to the inner end of said casing, a hollow liquid cooled electrical conductor having one end in said casing and extending out the other end of said casing, an electrode having one end removably connected to each of said holder and conductor, means connected to said casing between the ends thereof for draining a liquid coolant from said casing, and limit stop means on the casing adapted to contact refractory of a furnace and limit the extent to which the electrode can enter a furnace in a downward direction so that the electrode is supported by contact between the limit stop means and the furnace refractory while permitting the electrode to be elevated to a position within a furnace for inspection and without shutting off power to said conductor.

4,468,780

METHOD OF LINING A STEEL-MAKING FURNACE

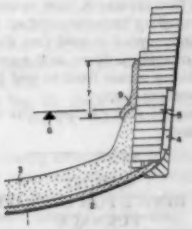
Franz Scheilberg, Sèvres; Bernard Kauffeisen, Louveciennes, both of France; Manfred Oberbach; Gerhard Zingel, both of Krefeld, Fed. Rep. of Germany, and Günter Wieland, Wiesbaden, Fed. Rep. of Germany, assignors to Didier-Werke A.G., Wiesbaden, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,476

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133572

Int. Cl.³ F27D *1/12*, *1/16*

U.S. Cl. 373—75 38 Claims



28. A steel-making furnace which comprises:

a wall area;

a bottom area;

a first lining of bricks on said bottom area;

a second lining of at least one member selected from the group consisting of bricks and a water cooling box on at least a portion of said wall area;

a first refractory material on said first lining and a lower portion of said second lining; and

a second refractory material on an upper portion of said second lining above said lower portion, said second refractory material being formed by applying to said upper portion, in a substantially clean state, a mixture comprising 100 parts by weight of magnesium oxide, 0.5 to 5 parts by weight of green chromium oxide, 0.5 to 3 parts by weight of clay, 0.5 to 3 parts by weight, in total, of at least one member selected from the group consisting of an alkali metal metaphosphate and a alkali metal polyphosphate, 0.2 to 1.5 parts by weight of an alkali metal bisulfate, and 8 to 10 parts by weight of water, and heating said mixture to cause hardening thereof.

4,468,781

TILTABLE ARC FURNACE

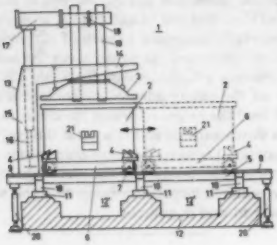
Karl Bühler, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Oct. 7, 1981, Ser. No. 309,482

Claims priority, application Switzerland, Oct. 9, 1980, 7540/80

Int. Cl.³ F27D *3/02, 3/06, 3/12*

U.S. Cl. 373—84 **7 Claims**



1. A tiltable arc furnace comprising:

a furnace shell having a width;

a cover positionable on said furnace shell;

a platform having a length of at least two said furnace widths in a first direction, said platform being pivotally supported on a foundation along said entire length by at least three rolling contact cradles, said cradles being constructed and oriented to roll on three cradle-beams disposed one at each end of said platform and one intermediate said ends of said platform, thereby to provide pivoting of said platform in a second direction at right angles to said first direction; and

means for supporting said shell on said platform for movement in said first direction, said means for supporting comprising travelling lines mounted on said platform and extending uninterrupted in said first direction along the entire length of said platform, said means for supporting further comprising means fixed to said shell and movable along said travelling lines,

whereby pivoting of said platform tilts said shell in said second direction.

4,468,782

METHOD AND DEVICE FOR OPERATING A DC ARC FURNACE

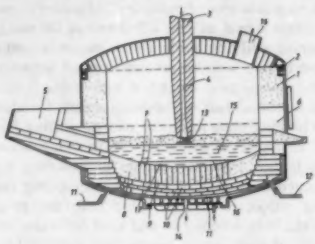
Sven-Einar Stenkvist, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Nov. 23, 1982, Ser. No. 443,916

Int. Cl.³ F27D *3/14*

U.S. Cl. 373—84 **2 Claims**

1. A method for operating a DC arc furnace having an arcing electrode and a concave hearth under the electrode and having a centrally localized electrically conductive bottom wear lining portion formed by a refractory through which interspaced metal elements extend from top to bottom and to which portion slag is aggressive, the furnace having controllable means for tapping a melt from the hearth; the method comprising operating the furnace with a molten metal melt in the hearth with slag floating on top of the melt, tapping the



furnace so that the melt runs off from the hearth, and stopping the tapping before the melt uncovers the conductive wear lining portion completely and exposes the uncovered portion to the aggressive action of the slag.

4,468,783

ELECTRODE FOR ARC FURNACES

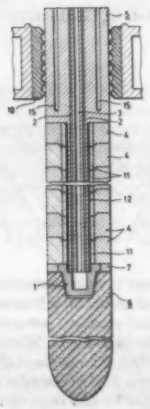
Hanns G. Bauer, Witten-Bommern, Fed. Rep. of Germany; Dieter H. Zöllner, Clare, Ireland; Josef Otto; Josef Mühlenbeck, both of Wetter, Fed. Rep. of Germany; Friedrich Rittmann, Rückersdorf, Fed. Rep. of Germany; Claudio Conradty, Röthenbach a.d. Pegnitz, Fed. Rep. of Germany; Inge Lauterbach-Dammler, Nuremberg, Fed. Rep. of Germany, and Horst Sonke, Leinburg, Fed. Rep. of Germany, assignors to Arc Technologies Systems Ltd., Cayman Islands

Filed Jul. 21, 1981, Ser. No. 285,514

Claims priority, application European Pat. Off., Oct. 27, 1980, 106581.4

Int. Cl.³ H05B *7/101*

U.S. Cl. 373—93 **19 Claims**



1. A metellurgical arc furnace having an electrode, said electrode comprising: an electrical current conducting metallic top portion and a consumable, replaceable bottom portion, a threadable interconnection between the portions; the top portion including a cooling means having a supply and return, each extending longitudinally through the top portion; the top portion including at least one insulation support; and a plurality of ring-like insulative moulding sections having an inner diameter sufficiently in excess of an outer diameter of the top portion whereby, when the furnace is in operation, the mould-

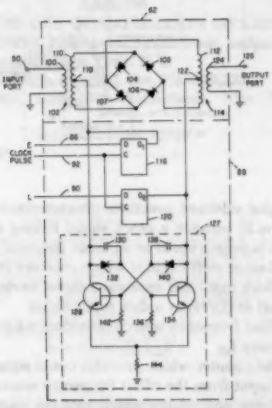
ing section slideably surrounds at least a portion of the top portion.

4,468,784

THREE-STATE DIGITAL MIXER-DRIVER CIRCUIT

Paul G. Jagnow, Iowa City, and David K. Vail, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 153,226, May 17, 1980, Pat. No. 4,385,401. This application Sep. 15, 1982, Ser. No. 418,494
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ H04B *1/10*
U.S. Cl. 375—1 **14 Claims**



1. RF signal conversion apparatus, comprising:

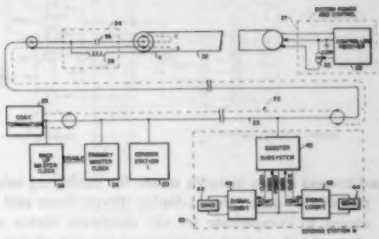
a signal mixer including input means for receiving a RF signal and output means coupled to the input means for coupling said RF signal mixed to an external user device; and means for controlling circulation of said RF signal traversing the mixer, said circulation controlling means including first means coupled to said mixer for injecting a first binary encoded signal serially into said mixer, the first signal injecting means including first means for driving current through said mixer in a first direction, second means coupled to said mixer for injecting a second binary encoded signal serially into said mixer, the second signal injecting means including second means for driving current through said mixer in a second direction, and means coupled to said mixer and responsive to the first and second current driving means for steering the current in the first and second directions during respective first and second states of said RF signal conversion apparatus, the first current driving means being enabled during the first state of said RF signal conversion apparatus in response to an enabling level of the first binary encoded signal applied to the first signal injecting means concurrently with a disabling level of the second binary encoded signal applied to the second signal injecting means, the second current driving means being enabled during the second state of said RF signal conversion apparatus in response to an enabling level of the second binary encoded signal applied to the second signal injecting means concurrently with a disabling level of the first binary encoded signal applied to the first signal injecting means, the current steering means during a third state of said RF signal conversion apparatus being responsive to enabling levels of the first and second binary encoded signals applied concurrently to the first and second current injecting means and to disabling levels of the first and second binary encoded signals applied concurrently to the first and second current injecting means to disable the first and second current driving means thereby stopping the circulation of current in said mixer during the third state of said RF signal conversion apparatus.

4,468,785

TELEMETRY SYSTEM WITH SIGNAL BOOSTER FOR DIGITAL DATA TRANSMISSION THROUGH A TRANSMISSION LINE

Robert W. Harris, Crofton, Md., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 272,125, Jun. 10, 1981,. This application Nov. 20, 1981, Ser. No. 323,599
Int. Cl.³ H04L *29/20*
U.S. Cl. 375—4 **22 Claims**



5. A circuit for boosting a digital data signal transmitted on an electronic transmission line, comprising:

a first coupling network, coupled to the electronic transmission line, for sensing the current on the electronic transmission line and for generating a first sensing signal;

a second coupling network, coupled to the electronic transmission line, for sensing the voltage on the electronic transmission line and for generating a second sensing signal;

switching means, operatively connected to said first and second coupling networks, for alternately switching between first and second states so that said booster circuit injects a booster signal onto the electronic transmission line to enhance the amplitude and rise time of the digital data signal, the booster signal including a voltage signal injected onto the electronic transmission line through said first coupling network and a current signal injected onto the electronic transmission line through said second coupling network.

4,468,786

NONLINEAR EQUALIZER FOR CORRECTING INTERSYMBOL INTERFERENCE IN A DIGITAL DATA TRANSMISSION SYSTEM

Robert C. Davis, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 21, 1982, Ser. No. 420,886
Int. Cl.³ H04B *3/14*
U.S. Cl. 375—11 **19 Claims**

1. A signal processing arrangement for correcting distortion of signals having expected values representative of different symbols which have been transmitted over a communication channel in successive intervals comprising:

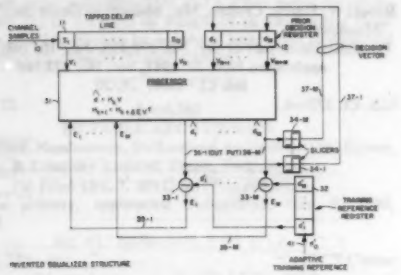
first means for storing a first plurality of data values representative of symbols that have been received from said communication channel during successive intervals of time;

second means for modifying said first plurality of data values to compensate for the distortion action of said channel and producing a second plurality of data values as estimates of symbols transmitted over said communication channel;

third means coupled to receive each of said second plurality

of data values and generating therefrom a third plurality of data values representative of symbols capable of being transmitted over said communication channel based upon said symbol estimates; and

fourth means for storing said third plurality of data values and coupling said stored third plurality of data values to said second means; and wherein



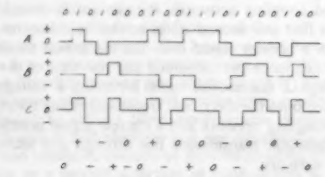
said second means includes means for modifying said third plurality of data values coupled thereto from said fourth means to compensate for the distortion action of said channel and producing said second plurality of data values in accordance with the modified first plurality and the modified third plurality of data values.

4,468,787

TERNARY DATA TRANSMISSION SYSTEM

Francis P. Keiper, Jr., Sunnyvale, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Nov. 9, 1981, Ser. No. 319,632
Int. Cl.³ H04L 25/49
U.S. Cl. 375—17 **16 Claims**



1. A data transmission system comprising:

a source of data signal in ternary form having a high level, a low level, and an intermediate level, the data signal having a bit time period equal to the minimum duration of each level; the high and low levels representing a first binary value and the intermediate level representing a second binary value, the data signal following an encoding rule in which the data signal assumes different levels for successive occurrences of the first binary value separated by an odd number of bit time periods and assumes the same level for successive occurrences of the first binary value separated by zero or an even number of bit time periods;

means having a high pass characteristic for transmitting the data signal to a remote point;

means at the remote point for receiving the data signal;

means for deriving a ternary change representative signal equal to the received data signal minus a delayed version thereof; and

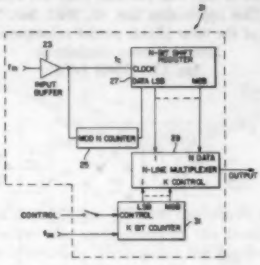
means for controlling the peak amplitude of the change representative signal to maintain a constant average value thereof.

4,468,788

DIGITAL FREQUENCY TRANSLATOR FOR OFFSET FREQUENCY GENERATION OF UNMODULATED SIGNALS

G. David Stoneburner, Mishawaka, Ind., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 13, 1982, Ser. No. 416,997
Int. Cl.³ H03K 7/06
U.S. Cl. 375—23 **13 Claims**



1. A digital sideband generator characterized by:

(a) means to provide a clock signal having a frequency f_c which is proportional to an input frequency f_{in}.

(b) an N-stage shift register which receives the clock signal as a clock input and receives a signal having a frequency f_d equal to (f_c/N) as a data input signal;

(c) an offset frequency source providing a signal at an offset frequency f_{os};

(d) a K-bit counter which provides count signals in response to an input from the offset frequency source;

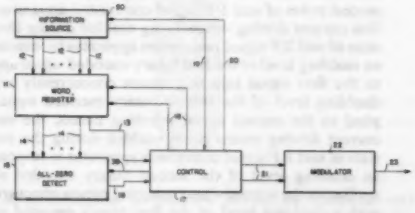
(e) an N-line multiplexer which receives signal pulses from the N-stage shift register and the count signals from the K-bit counter and provides an input delayed in accordance with the count signals, so that when K equals $\log_2 N$, the multiplexer provides an output at an output frequency equal to $(f_d \pm f_{os})/N$.

4,468,789

METHOD FOR SERIAL TRANSMISSION AND RECEIPT OF BINARY INFORMATION

William E. Gromen, Ft. Washington, Md., assignor to The United States of America as represented by the Director of the National Security Agency, Ft. George C. Meade, Md.

Filed Nov. 16, 1981, Ser. No. 322,112
Int. Cl.³ H04L 3/00
U.S. Cl. 375—25 **8 Claims**



1. A method of transmission of a sequence of binary words, each word consisting of a plurality of bits, each bit having either a first value or a second value, comprising the steps of:

(a) inserting a word into a word register;

(b) detecting the value of each bit of said word in said register sequentially, beginning with an end-most bit;

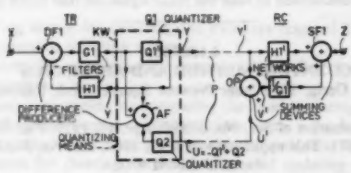
(c) transmitting, after each detection, a signal representative of the value of the detected bit;
(d) testing, after each detection, all but the previously detected bits of the word in said register until no tested bits have the second value;
(e) upon the occurance of no tested bits having the second value, transmitting a signal indicative of the end of transmission of the word; and
(f) repeating steps (a) through (e) until all words in the sequence have been transmitted.

4,468,790

SYSTEM FOR THE QUANTIZATION OF SIGNALS

Martijn H. H. Höfelt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,233
Claims priority, application Netherlands, Mar. 12, 1981, 8101199
Int. Cl.³ H04B *12/04*
U.S. Cl. 375—30 **3 Claims**



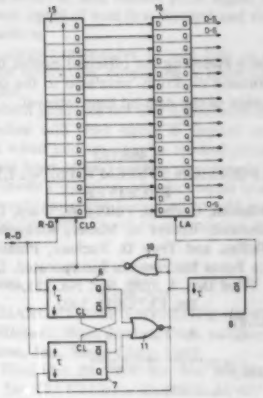
1. In a system for the quantization of signals having a transmitter section and a receiver section, the transmitter section having quantizing means, a difference producer and filter means, wherein an input signal and a first quantized output signal which is derived from the quantizing means and functions as a feedback signal are applied to the difference producer, and a signal derived from the output signal of the difference producer is applied to the quantizing means, the latter serving to quantize the level of the signal derived from the output signal of the difference producer in a plurality of quantizing levels in order to produce said first quantized output signal, filter means being connected in the path of the input signal for relatively influencing the spectrum of the quantizing noise with respect to the spectrum of the input signal, the improvement comprising said quantizing means being adapted for providing a second quantized output signal in response to the signal derived from the output signal of the difference producer and the receiver section comprising a first network having a first transfer function and having applied thereto a first received signal which is proportional to the first output signal of the transmitter section, a second network having a second transfer function for relatively influencing the spectrum of a second received signal which is proportional to the second output signal of the transmitter section applied thereto, said second network influencing the spectrum of said second received signal in a manner which is similar to the manner in which the said filter means influences the spectrum of the quantizing noise in the transmitter section, summing means for combining the output signal of the first network with the output signal of the second network to provide a receiver section output signal, the transfer functions of the first and second networks being so determined relative to the transfer function of the transmitter section that on combining the received signals the quantizing noise in the first received signal is cancelled by that portion of the quantizing noise in the second received signal which is proportional to the quantizing noise of the first quantized output signal of the quantizing means.

4,468,791

METHOD AND FACILITY FOR DECODING A BIPHASE-CODE AND APPLICATION OF THE METHOD

Vratislav Masek, Würenlos, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 350,810, Feb. 22, 1982,. This application Feb. 2, 1984, Ser. No. 576,466
Claims priority, application Switzerland, Feb. 27, 1981, 327/81
Int. Cl.³ G11B *5/09*
U.S. Cl. 375—87 **3 Claims**



1. A device for decoding a biphase-encoded data-signal, comprising:
a timing element with an impulse length between one and two data-signal periods, a first output of which is set by positive and a second by negative signal edges;
setting of the first output being inhibited while the second output is set and vice versa;
a clock extraction circuit connected to the outputs of the timing element extracting a periodic clock signal with a period double the data signal period from the output signals of the timing element; and
a data extraction circuit comprising a bistable element connected to the outputs of the timing element, said data extraction circuit extracting decoded data from the output signals of the timing element.

4,468,792

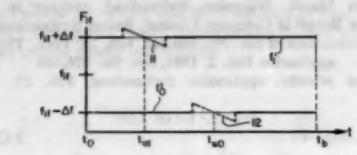
METHOD AND APPARATUS FOR DATA TRANSMISSION USING CHIRPED FREQUENCY-SHIFT-KEYING MODULATION

Lewin T. Baker; Sanjay K. Bose, both of Schenectady; George W. Ellis, Burnt Hills, and Charles M. Puckette, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,706
Int. Cl.³ H03K *7/06*
U.S. Cl. 375—45 **54 Claims**

1. A method for transmission of digital data, comprising the steps of:
(a) transmitting a carrier having a selected substantially-constant initial frequency f_c;
(b) providing a sequence of substantially-constant data bit time intervals, each commencing essentially at the termination of the previous data bit time interval, and during each of which one bit of said digital data is to be transmitted;
(c) offsetting the carrier initial frequency, at the start of each data bit transmission time interval, by an offset frequency

Δf established only by the data value of the data bit to be transmitted in that data bit time interval; and



(d) frequency sweeping the offsetted carrier frequency in a predetermined direction, unrelated to the data value, for the duration of the data bit time interval.

4,468,793

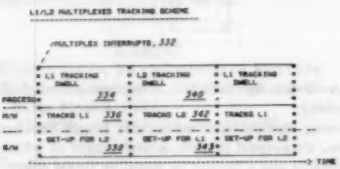
GLOBAL POSITION SYSTEM (GPS) MULTIPLEXED RECEIVER

Charles R. Johnson, Garland; Phillip W. Ward, Dallas; Joe H. Lindley, Garland; Robert A. Maher, Richardson; Jerry D. Holmes, Dallas, and Troy D. Fuchser, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 1, 1980, Ser. No. 211,499

Int. Cl.³ G01S *5/02*

U.S. Cl. 375—97 **15 Claims**



14. A global positioning system comprising: an RF receiver consisting of a single channel having operatively connected therein a multiplexing means for alternately selecting incoming L1 and L2 signals transmitted from space vehicles and a tracking circuit means for tracking vehicle dynamics and ionospheric delay effect on RF signals transmitted from a space vehicle.

4,468,794

DIGITAL COHERENT DETECTOR

William M. Waters, Millersville, Md., and Bobby R. Jarrett, Fredericksburg, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 11, 1982, Ser. No. 338,396

Int. Cl.³ H04B *15/00*

U.S. Cl. 375—103 **12 Claims**

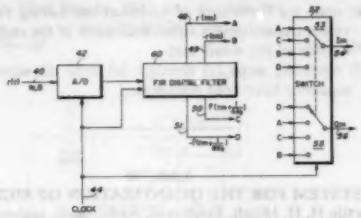
1. A digital coherent detector for directly sampling an I.F. signal to obtain its I and Q coefficients comprising:

means for sampling and digitizing an analog bandpass signal $r(t)=I(t)\cos 2\pi f_o t-Q(t)\sin 2\pi f_o t$ at a sampling frequency of $f_s=2f_o/(M-\frac{1}{4})=2W$ so that the sin and cos sinosoidal terms alternately go to zero and one, respectively, such that samples $r(t_m)$ are alternately equal to I(t) and then Q(t), where M is an integer, W is the bandwidth of the input signal, I(t) and Q(t) are the in-phase and quadrature coefficient of the signal, and f_o is the center frequency of the signal and equals $(2M-1)W/2$;

estimating means connected to the output of said sampling and digitizing means for determining an estimate $r(t_m)$ for the coefficient whose sin or cos sinosoidal term has gone to zero in a given sample from the N preceding and the N succeeding sampled signals;

an I output line;

a Q output line; and



switching means for switching between the I and Q output lines in accordance with the sampling frequency clock pulse alternate samples $r(t_m)$ with appropriate signs, while switching with appropriate sign the estimate signal $r(\sim t_m)$ to be paired with each $r(t_m)$ signal to the I or Q output line not connected to take the $r(t_m)$ signal on that clock pulse.

4,468,795

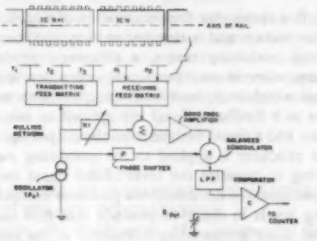
COUNTING METHOD AND APPARATUS

John S. Gerig, 1916 Isaac Newton Square West, Reston, Va. 22090

Continuation of Ser. No. 30,800, Apr. 17, 1979, Pat. No. 4,329,571. This application Jan. 22, 1982, Ser. No. 342,028

Int. Cl.³ G06M *9/00*

U.S. Cl. 377—6 **37 Claims**



10. Integrated circuit counting apparatus comprising plural electrodes, at least one of the electrodes connected to field creating means for inducing voltage by mutual capacity on adjacent integrated circuits, said integrated circuits approximating isopotential surfaces, at least one other electrode connected to a field receiving means coupled by mutual capacity to voltage on adjacent circuits, and count producing means connected to the field creating means and field receiving means for producing a count which indicates passing of an integrated circuit near the plural electrodes.

4,468,796

FREQUENCY RELAY FOR USE IN THE PROTECTION OF ELECTRIC POWER TRANSMISSION LINES

Noriyoshi Suga, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 30, 1981, Ser. No. 258,926

Claims priority, application Japan, Apr. 30, 1980, 55-57556

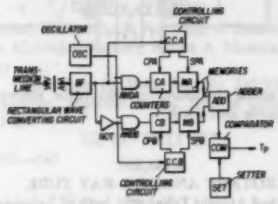
Int. Cl.³ G01R *31/08*

U.S. Cl. 377—28 **7 Claims**

1. a frequency relay comprising:

oscillating means for generating a reference frequency signal;

input means for receiving AC electric signals;
first counting means connected to the oscillating means and the input means for counting the number of pulses at the output of the oscillating means only during the positive half cycle of the AC electrical signals;
second counting means connected to the oscillating means and the input means for counting the number of pulses at the output of the oscillating means only during the negative half-cycle of the AC electric signals;
first and second updating means having respective outputs and respectively connected to the first and second counting means for updating the numbers counted by the respective counting means;
means for combining the outputs of said first and second updating means;
comparing means for comparing the combined output of the first and second updating means with a predetermined setting value at each half-cycle of the electric signals;
means for clearing the first and second updating means in response to the AC electric signal from the input means; and
means for clearing the first and second counting means in response to the AC electric signal from the input means.

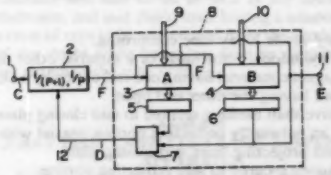


4,468,797

SWALLOW COUNTERS

Yasuhiro Shin, Tokyo; Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1982, Ser. No. 345,532
Claims priority, application Japan, Feb. 13, 1981, 56-18938; Mar. 18, 1981, 56-37958
Int. Cl.³ H03K *21/30*
U.S. Cl. 377—52 **5 Claims**



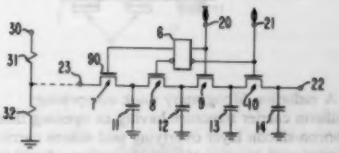
1. A swallow counter comprising:
a two modulus prescaler which produces a frequency divided signal obtained by selectively dividing a frequency of an input pulse signal by 1/P or 1/(P+1) (where P is an integer) in accordance with a first or second level of a control signal;
a first programable counter having a predetermined maximum count, said counter starting counting from a set value designated by a first preset data signal in response to said frequency divided signal for producing a first code signal;
a second programable counter responsive to a most significant bit of said first code signal for starting counting from a set value designated by a second preset data signal so as to produce a second code signal;
a first code detector for detecting a specific code signal of said first and second code signals for producing a first pulse signal;
a third programable counter responsive to said frequency divided signal for starting counting from a set value designated by a third preset data signal so as to produce a third code signal;
a second code detector which detects a specific bit of said third code signal for producing a second pulse for a predetermined interval, said second pulse signal being utilized as a preset signal of said first, second and third programable counters;
a flip-flop circuit responsive to said first or second pulse signal for selectively outputting a reset signal or a set signal; and
a means which produces the first signal level of said control signal when said reset signal is applied to said means, whereas when said set signal is applied produces the second signal level of said control signal each time said frequency divided signal of a number equal to said predetermined maximum count is applied to said means but produces the first signal level of said control signal in other intervals.

4,468,798

DUAL CHARGE PUMP ENVELOPE GENERATOR

Gerardus F. Riebeek, West Jordan, Utah, assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Oct. 24, 1980, Ser. No. 200,284
Int. Cl.³ G11C *19/28*; H03K *17/687*
U.S. Cl. 377—57 **8 Claims**



1. A dual charge pump envelope generator comprising:
an input terminal for receiving a reference voltage;
an output terminal for supplying an output voltage;
a first output storage capacitor having a first plate connected to ground, and a second plate;
a first switched capacitor resistor-equivalent circuit having an input lead and an output lead, said input lead being connected to said input terminal and said output lead being connected to said second plate of said first output storage capacitor, said first switched capacitor resistor equivalent circuit including a first intermediate storage capacitor having a first plate, and a second plate connected to ground, a first switch means controlled by one clock pulse and a first pair of non-overlapping clock pulses, said first switch means connected between said first switched capacitor resistor equivalent circuit input lead and said first plate of said first intermediate storage capacitor, and a second switch means controlled by a second clock pulse of said first pair of non-overlapping clock pulses connected between said first plate and said first intermediate storage capacitor and said output lead of said first switched capacitor resistor equivalent circuit;
a second output storage capacitor having a first plate connected to said output lead and a second plate connected to ground; and
a second switched capacitor resistor-equivalent circuit having an input lead connected to said second plate of said first output storage capacitor and an output lead con-

nected to said first plate of said second output storage capacitor, said second switched capacitor resistor equivalent circuit including a second intermediate storage capacitor having a first plate, and a second plate connected to ground, a third switch means controlled by one clock pulse of a second pair of non-overlapping clock pulses connected between said second switched capacitor resistor equivalent circuit input lead and said first plate of said second intermediate storage capacitor, and a fourth switch means controlled by said second clock pulse of said second pair of non-overlapping clock pulses connected between said first plate of said second intermediate storage capacitor and said output lead of said second switched capacitor resistor equivalent circuit;

wherein said second pair of non-overlapping clock pulses have a frequency n times the frequency of said first pair of non-overlapping clock pulses, where n is a selected integer.

4,468,799

RADIATION LITHOGRAPHY MASK AND METHOD OF MANUFACTURING SAME

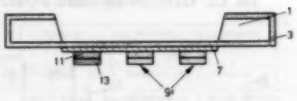
Margret Harms, Hamburg; Holger Lüthje, Halstenbek, and Bernd Matthiessen, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 29, 1982, Ser. No. 372,886

Claims priority, application Fed. Rep. of Germany, May 18, 1981, 3119682

Int. Cl.³ B01J *17/00*

U.S. Cl. 378—35 **4 Claims**



1. A radiation lithography mask comprising:

a silicon carrier structure having an opening therethrough,

a boron-silicon layer overlying said silicon carrier and covering said opening at a major surface of said carrier, and

a radiation absorbing layer provided at said major surface over said boron-silicon layer,

wherein said radiation absorbing layer is an internally stress-compensated double layer of two different metals, and

wherein a further stress-compensating layer of titanium or titanium oxide is provided on at least one side of said boron-silicon layer, said further layer being substantially transparent to radiation.

4,468,800

ROTARY ANODE X-RAY TUBE

Rudolf Friedel, Kleinseebach, and Ernst Geldner, Weiher, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

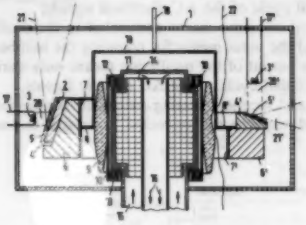
Filed Jun. 4, 1981, Ser. No. 270,366

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022618

Int. Cl.³ H01J *35/04*

U.S. Cl. 378—131 **9 Claims**

1. A rotary anode x-ray tube comprising a tube wall, an annular anode mounted for rotation about a central axis, motor means comprising a stator and rotor on opposite sides of the tube wall, the annular anode as well as the stator and the rotor being disposed concentrically inside is free of any shaft, and which has a rotor cylindrical surface at the side of said rotor sleeve toward said annular anode, bearing means for directly supporting the rotor sleeve itself, and the annular anode having an anode annular surface concentric with said central axis, the central part of said rotor cylindrical surface being connected with said anode annular surface to provide a supporting and driving coupling between said rotor and said annular anode,



said annular anode surrounding said rotor sleeve and said stator being inside said rotor.

4,468,801

ROTARY ANODE X-RAY TUBE

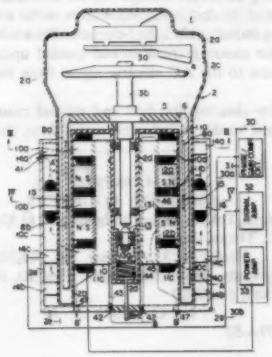
Hajime Sudo, and Atsushi Takahashi, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 26, 1982, Ser. No. 401,814

Claims priority, application Japan, Jul. 30, 1981, 56-118428

Int. Cl.³ H01J *35/04*

U.S. Cl. 378—132 **21 Claims**



1. A rotary anode X-ray tube comprising:

a hollow cylindrical rotor made of a material other than a ferromagnetic material having one end closed by a closing plate and having the other end open;

a conductive shaft member secured to said closing plate and having an outwardly projecting portion coaxial with said rotor and projecting from said closing plate;

a rotary anode secured to said projecting portion;

a cathode disosed to face a rotating peripheral surface of said rotary anode;

at least one ring member made of a ferromagnetic material provided on the inner periphery of said rotor;

an evacuated casing made of a material other than a ferromagnetic material including an outer tube covering said cathode, rotary anode and outer periphery of rotor and having an X-ray emission window and an inner tube covering the inner periphery of said rotor and united by a uniting portion covering the open end of said rotor to said outer tube;

at least one permanent magnet magnetized in the radial direction of said rotor and having one of the opposite pole sides, i.e. N and S magnetic poles, in contact with the inner periphery of said inner tube;

a yoke provided inside said inner tube and in contact with the other pole end of said permanent magnet, said yoke having first and second poles provided on the inner periphery of said inner tube corresponding to the opposite sides of said permanent magnet in the axial direction of said rotor, said second pole corresponding to one of the opposite ends of said ring member;

a control winding wound on at least one of said first and second poles; and

means for giving a rotational driving force to said rotor.

4,468,802

X-RAY TUBE

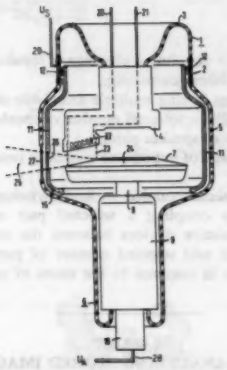
Rudolf Friedel, Kleinseebach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 10, 1982, Ser. No. 347,714

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107949

Int. Cl.³ H01J *35/00*

U.S. Cl. 378—140 **5 Claims**



1. An x-ray tube comprising an anode, a cathode arrangement including a cathode, a shield laterally surrounding the discharge space between the anode and cathode, characterized in that the shield is connected to a potential in the range of between half and full anode potential, said shield surrounding said cathode and said anode as well as the discharge space therebetween, and said shield itself having a window for defining a cone of rays to be transmitted from the anode, the potential of the shield while being less than anode potential being greater than half the tube voltage.

4,468,803

X-RAY FILM CASSETTE FRAME SUSPENSION APPARATUS

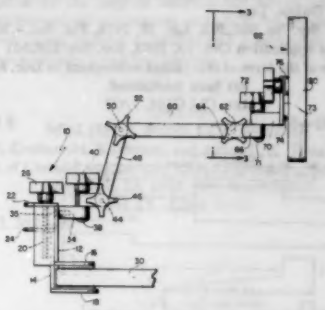
Mary R. Ronci, 143 Hoffman Ave., Apt. 405, Cranston, R.I. 02920

Filed Sep. 29, 1982, Ser. No. 427,804

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—181 **6 Claims**

1. Suspension apparatus for an X-ray film cassette frame comprising a clamping member for rigid attachment to a supporting element, a projection rigidly attached to said clamping member, a first arm connected to said projection for pivoting movement in a first plane through a path of approximately 220°, a second arm connected with said first arm and pivotable in a second plane through a path of more than 180°, a third arm connected with said second arm and pivotable in said second plane through a path of generally 360°, a fourth arm connected with said third arm and pivotable in said second plane through a path of generally 360°, a link connected with said fourth arm and pivotable in said first plane through a path of approximately 360°, coupling means connecting an X-ray film cassette frame with said link, and means for securing said projection,



said first, second, third and fourth arm, and said link in preselected positions to thereby dispose said film cassette frame in any desired position along a 360° arc of said first path and along a 360° arc of said second path.

4,468,804

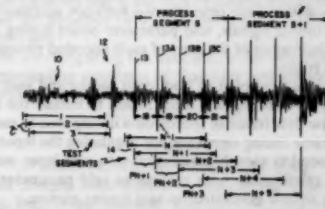
SPEECH ENHANCEMENT TECHNIQUES

James M. Kates, Andover, and Julian J. Busgang, Lexington, both of Mass., assignors to Signatron, Inc., Lexington, Mass.

Filed Feb. 26, 1982, Ser. No. 352,958

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—47 **14 Claims**



1. A method of processing a voiced speech waveform which is generally periodic, the periods and peak amplitudes of which may be non-uniform, said method comprising the steps of

processing said speech waveform so as to provide successive processed portions thereof, each portion having a substantially uniform period; and

supplying said processed portions successively to provide an output speech waveform which is an effective reproduction of said input speech waveform, wherein the pitch fluctuations of the voiced sounds have been smoothed.

4,468,805

VARIABLE FRAME LENGTH DATA CONVERTER FOR A SPEECH SYNTHESIS CIRCUIT

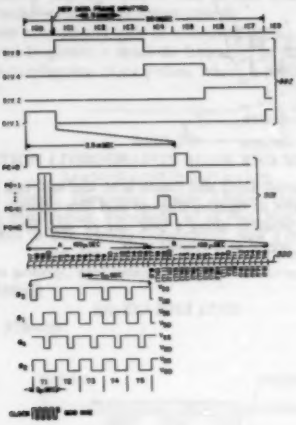
Richard H. Wiggins, Jr., Dallas, and George L. Brantingham, Lubbock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 901,392, Apr. 28, 1978, Pat. No. 4,304,964. This application Oct. 13, 1981, Ser. No. 310,661

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—51 9 Claims



1. A speech synthesis system comprising:

input means for receiving encoded speech data in respective data frames of variable length, wherein said variable length data frames include encoded speech parameters of variable length which are representative of pitch, energy and filter coefficients, and each frame of said variable length data frames having at least one encoded speech parameter;

speech synthesis means coupled to said input means for converting said encoded variable length speech parameters into analog signals representative of human speech, said speech synthesis means including:

timing means for generating timing signals including data frame timing signals indicative of the start of each successive data frame and a plurality of parameter count timing signals within each time interval between successive data frame timing signals, said parameter count timing signals being indicative of the start of each encoded parameter in a data frame;

control means coupled to said input means and said timing means for enabling said input means to initiate the receipt of a new data frame of speech data in response to each said data frame timing signal and for regulating the inputting of said encoded speech parameters into said input means in timed relationship with respect to said parameter count timing signals generated by said timing means;

means coupled to said input means and said timing means for testing a first encoded parameter loaded into said input means after the occurrence of a data frame timing signal to determine whether said first encoded parameter is a preselected code;

control circuit means responsive to the detection of said preselected code for said first encoded parameter to generate an inhibit signal preventing the loading of further parameters into said input means until the next data frame of speech data is ready to be input to said input means as determined by the occurrence of said data frame timing signal; and

audio means for convering said analog signals representative of human speech into audible sounds.

4,468,806

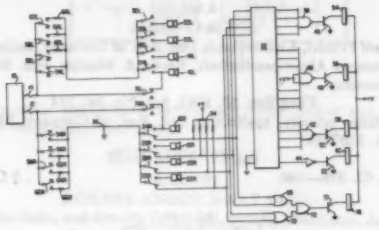
STERO SPEAKER MIXER

Joe L. Gaulden, P.O. Box 1499, Lewisville, Tex. 75067, and Perry L. Compton, P.O. Box 78607, The Colony, Tex. 75056

Filed May 13, 1983, Ser. No. 494,424

Int. Cl.³ H04R *3/12*

U.S. Cl. 381—123 12 Claims



1. Apparatus for coupling a plurality of speaker pairs to the output of an amplifier comprising:

switching means having multiple selectable states for coupling in parallel a selected number of speaker pairs from said plurality of speaker pairs;

a plurality of pairs of impedance matching resistive devices; and

digital logic means coupled to said switching means for automatically coupling a selected pair of impedance matching resistive devices between the output of said amplifier and said selected number of parallel coupled speaker pairs in response to the states of said switching means.

4,468,807

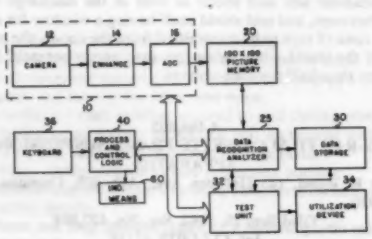
METHOD FOR ANALYZING STORED IMAGE DETAILS

Clifford H. Moulton, Portland, Oreg., assignor to Palmguard, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 165,603, Jul. 3, 1980, Pat. No. 4,371,865. This application Jul. 13, 1981, Ser. No. 282,866

Int. Cl.³ G06K *9/56*

U.S. Cl. 382—2 3 Claims



1. A method of recording the characteristics of the palm of a person, comprising the steps of:

positioning the person's palm in relation to a palm-positioning means;

scanning the palm by the use of scanning means to produce an image of the person's palm;

producing abstractions based on calculations and representative of the person's palm;

temporarily storing said abstractions;

processing more than one of said abstractions to determine if

the abstractions are acceptable in comparison to each other; and

permanently storing more than one of said acceptable abstractions.

4,468,808

FEATURE EXTRACTION SYSTEM FOR DIGITIZED CHARACTER INFORMATION

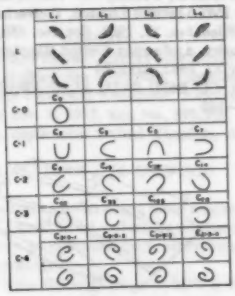
Shunji Mori, Kashiwa; Hiromitsu Yamada, Sakura; Kunihiko Takeuchi, Kawasaki, and Michihisa Do, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology; Tokyo Keiki Co., & Ltd. and Totec Co., Ltd., all of Tokyo, Japan

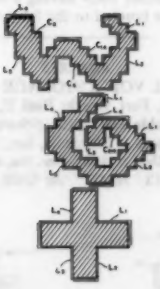
Filed Jan. 19, 1981, Ser. No. 226,091

Claims priority, application Japan, Jan. 21, 1980, 55-4520

Int. Cl.³ G06K *9/46*

U.S. Cl. 382—20 **4 Claims**





1. A method of extracting, for the purpose of recognition processing, character features from a character pattern detected by an optical scanner, digitized into character digital bits and background digital bits and stored in a two-dimensional memory, said method comprising the steps of:

(a) scanning said character pattern on the two-dimensional plane of said memory sequentially row by row to detect unit row pattern blocks each including a single row bit array;

(b) separating from each of said unit row pattern blocks predetermined parameters including a run of a series of character digital bits and respective run length data and coordinates data for each run of each said block;

(c) for each of said scanning steps, comparing the respective detected unit row pattern block with the unit row pattern block detected by the just preceding scanning such that in accordance with variations in the detected parameters in the compared unit pattern blocks, types of local features are detected in the form of a concavity opened upward, downward, left and right, and extracted and listed in correspondence with the compared unit pattern blocks; and

(d) successively integrating said local features extracted by each said scanning step, coding the results obtained in the course of the step of successively integrating and the predetermined parameters including run length data and then listing feature quantities and coordinates of respective segments as global features.

4,468,809

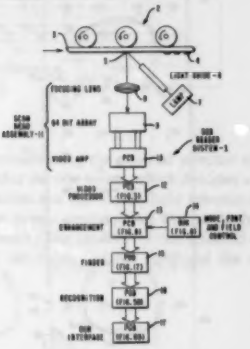
MULTIPLE FONT OCR READER

John S. Grabowski, Kitchener, and Aaron C. Y. Tong, Waterloo, both of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 23, 1981, Ser. No. 333,963

Int. Cl.³ G06K *9/80*

U.S. Cl. 382—50 **7 Claims**



1. An optical character recognition reader system, comprising:

means for optically capturing contrast data representing a character pattern on a document operated in a time sequence corresponding to a scan of the document;

means for generating at least two sets of data for each pattern of a character, which sets are distinguishable by the contrast level represented;

means for enhancing the contrast of a character pattern represented by said captured data, by analyzing the data representing adjacent elements and changing the data on the basis of data representing adjacent elements;

means for analyzing groupings of data in a window to establish the presence of a character pattern within the window; and

means for comparing the data within the window with data representing templates of character patterns to establish a substantial match.

4,468,810

CONVERTIBLE CARRYING BAG

Raffaela Longo, West Paterson, N.J., assignor to The Mat-Pack, Inc., West Paterson, N.J.

Filed Jan. 17, 1983, Ser. No. 458,741

Int. Cl.³ A45C *3/04*

U.S. Cl. 383—3 **16 Claims**

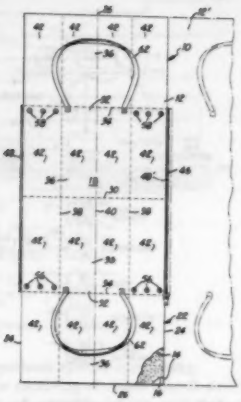
1. An article of manufacture convertible between a flat mat and an erect carrying bag, said article of manufacture comprising:

a body member of flexible foldable material, the body member having a longitudinal centerline and an outer periphery including opposed longitudinally-extending side edges and opposed laterally-extending end edges when the body member is in the flat mat configuration;

a first fold line extending laterally across the body member generally intermediate the end edges to define panels in the body member;

at least one second fold line extending laterally across the body member, the second fold line being located generally intermediate the first fold line and a corresponding end edge to define a pair of main sections in the corresponding panel, such that upon folding the body member along the second fold line the main sections of the corresponding panel will be juxtaposed with one another;

a pair of third fold lines extending longitudinally along the body member, each third fold line being located generally intermediate the longitudinal centerline of the body member and a corresponding longitudinally-extending side edge to define subsections in each of said panels, such that upon folding the body member along the third fold lines, subsequent to said folding along the second fold line,



subsections of each panel will be juxtaposed and the opposed side edges of the body member will confront one another;

fastening means located along said longitudinally-extending side edges of the body member for selectively fastening together the confronting longitudinally-extending side edges, subsequent to said folding along the third fold lines, to establish a collapsed, generally tubular configuration in the panels, the tubular configuration having opposite ends and openings located adjacent the opposite ends such that upon folding the body member along the first fold line the panels will be juxtaposed in side-by-side relationship and the openings will be adjacent one another to establish side-by-side receptacles extending between each opening and the first fold line; and

holding means for holding the panels in said side-by-side relationship to establish the erect carrying bag.

4,468,811

TAMPER-EVIDENT CLOSURE FOR BAG

Peter M. Shaw, Whitehaven, and Friedhelm Dahl, Workington, both of England, assignors to Smith Brothers (Whitehaven) Limited, England

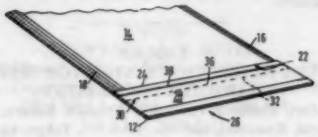
Filed May 25, 1983, Ser. No. 498,215

Claims priority, application United Kingdom, Mar. 25, 1983, 8308383

Int. Cl.³ B65D *33/20, 30/08*

U.S. Cl. 383—5 **15 Claims**

1. A pouch comprising two opposed webs having respective side and bottom portions sealed together thereby leaving an unsealed end whereat one of said opposed webs extends beyond the free edge of the other of said opposed webs to form a flap foldable onto over an edge portion of the other web, the flap having disposed thereon an area of adhesive means extending through a position for normal folding of the flap, so that the



flap is foldable within the area covered by said adhesive means to bring that latter into direct sealing contact at the flap fold.

4,468,812

FLEXIBLE CONTAINER

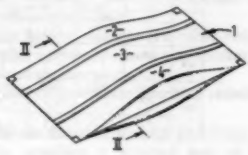
Ronald L. Grosvenor, Perton, Nr. Wolverhampton, England, assignor to IMI Marston Limited, Wolverhampton, England

Filed Jan. 17, 1983, Ser. No. 458,463

Claims priority, application United Kingdom, Jan. 30, 1982, 8202724; May 12, 1982, 8213784

Int. Cl.³ B65D *89/00, 85/72;* H05B *3/68*

U.S. Cl. 383—108 **10 Claims**



1. A flexible container for a potable liquid comprising a fabric reinforced rubber body having a lining of a non-orientated polypropylene bonded to the fabric reinforced body.

4,468,813

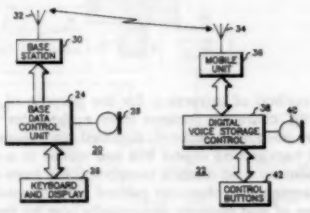
DIGITAL VOICE STORAGE SYSTEM

Timothy M. Burke, Fort Worth; Paul F. Smith, N. Richland Hills; Scott W. Noble, and Eric R. Schorman, both of Bedford, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 6, 1982, Ser. No. 446,890

Int. Cl.³ H04B *7/26;* G10L *1/08*

U.S. Cl. 455—38 **9 Claims**



1. A digital voice storage system, in a communications system adapted for voice and data communications over a communications medium, having at least one primary station and a plurality of remote secondary stations with all stations adapted to transmit a command data packet and each remote station having a predetermined station address stored in a station address register, the digital voice storage system comprising:

each primary station having,

means for providing a command data packet containing a record code and a station address;

means for providing a voice message and a termination code subsequent to completion of the message,

means for transmitting said command data packet, voice message and termination code to said secondary stations;

each secondary station having,

means for generating a record activation signal in response to receiving a command data packet having a record code and a station address corresponding to the station's stored predetermined station address, from a primary station,

means for analog to digital converting a voice message transmitted by the primary station and received by the secondary station, and storing the converted message in a digital memory in response to the record activation signal;

means for terminating the analog to digital conversion in response to the termination code.

4,468,814

RADIO CHANNEL VISUAL IDENTIFICATION SYSTEM

Robert C. Field, Dollard des Ormeaux, Canada, assignor to Canadian National Railway Company, Montreal, Canada

Filed Jun. 4, 1982, Ser. No. 385,305

Claims priority, application United Kingdom, Jun. 8, 1981, 8117438

Int. Cl.³ H04B *1/16*; G08B *5/38*

U.S. Cl. 455—159 **14 Claims**

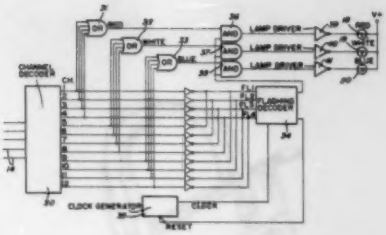
1. In a multi-channel radio having a radio frequency channel selector switch to select one of a plurality of channels, a visual identification system to indicate which radio frequency channel is in use, comprising,

a plurality of lights the number of which is less than the number of selectable channels, each light having a different colour,

means for mounting said lights in a visable location in close association with each other,

a light selector means to select only one of the plurality of coloured lights to flash,

a flash selector means to select a predetermined number of flashes for the selected light, and



means for interconnecting the channel selector switch to a channel selector decode means which decodes a particular channel selection and signals the light selector means and flash selector means representing the particular channel selection whereby the identity of the selected channel is indicated by the colour of the light and the number of light flashes.

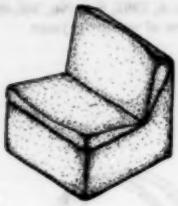
275,239
HOSIERY DONNING AND REMOVING APPLIANCE
Margaret M. Raso, 2 Dutch Ct., West Nyack, N.Y. 10994
Filed Apr. 20, 1982, Ser. No. 370,092
Term of patent 14 years
U.S. Cl. D2—378.2

275,240
BACKSTOP FOR A BASEBALL GLOVE OR SIMILAR ARTICLE
Saul Neidell, Fair Lawn, N.J., assignor to MacGregor Athletic Products, a division of The Equilink Corporation, East Rutherford, N.J.
Filed May 5, 1982, Ser. No. 375,334
Term of patent 14 years
U.S. Cl. D2—361

275,241
HANDBAG
Otto K. Schimmel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Phoenix, Ariz.
Filed Apr. 5, 1982, Ser. No. 365,494
Term of patent 14 years
U.S. Cl. D3—48

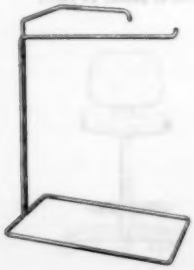
275,242
STOOL
William I. Stephens, Emmaus, Pa., assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 134,763, Mar. 23, 1980, , which is a continuation-in-part of Ser. No. 108,961, Jan. 18, 1980, , Ser. No. 62,006, Jul. 30, 1979, , and Ser. No. 38,124, May 11, 1979,. This application Aug. 13, 1982, Ser. No. 407,794
Term of patent 14 years
U.S. Cl. D6—360

275,243
UPHOLSTERED SETTEE
Harry R. Tiffany, III, 323 Spruce St., Philadelphia, Pa. 19106
Filed Apr. 5, 1982, Ser. No. 365,234
Term of patent 14 years
U.S. Cl. D6—364

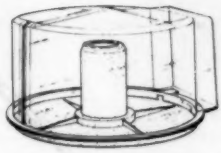


275,244
CHAIR
Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904
Division of Ser. No. 237,999, Feb. 25, 1981,. This application Nov. 12, 1982, Ser. No. 440,973
Term of patent 14 years
U.S. Cl. D6—373

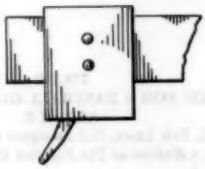
275,245
SUPPORT STAND FOR ELECTRONIC COMPONENTS
John R. Pack, 58 Iain Rd., Bearsden, Glasgow, Scotland
Filed May 11, 1981, Ser. No. 262,766
Claims priority, application United Kingdom, Nov. 12, 1980, 997539
Term of patent 14 years
U.S. Cl. D6—462



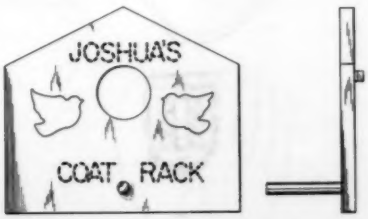
275,246
DISPENSER FOR ROLLED PAPER
Lars Lander, Zug, Switzerland, assignor to Molnlycke AB, Gothenburg, Sweden
Filed Oct. 20, 1982, Ser. No. 435,359
Claims priority, application France, Jul. 27, 1982, 822592
Term of patent 14 years
U.S. Cl. D6—521



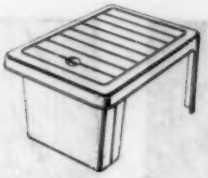
275,247
COMBINED SUPPORT RAIL AND SLIDING LOCKING BRACKETS THEREFOR FOR HOLDING MEDICAL EQUIPMENT
Leslie H. Sherman, Dumont, N.J., assignor to Impact Instrumentation, Inc., Bogota, N.J.
Filed Sep. 25, 1980, Ser. No. 190,843
Term of patent 14 years
U.S. Cl. D6—553



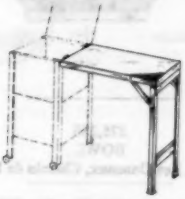
275,248
COAT RACK
Velma Parker, P.O. Box 8512, Grangerland, Tex. 77302
Filed Aug. 19, 1982, Ser. No. 409,572
Term of patent 14 years
U.S. Cl. D6—316



275,249
COCKTAIL TABLE
Didier Deconinck, Seyssins, France, assignor to Allibert S.A., Grenoble, France
Filed Apr. 15, 1982, Ser. No. 368,818
Term of patent 14 years
U.S. Cl. D6—436



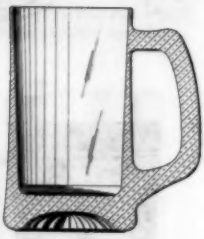
275,250
COLLAPSIBLE CLIP-ON DESK EXTENSION FOR A FILE CABINET
Alvin H. Kirsner, 3131 Fleur Dr., Des Moines, Iowa 50321
Filed Jun. 12, 1980, Ser. No. 158,735
Term of patent 14 years
U.S. Cl. D6—430

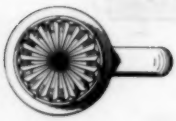


275,251
CORNER BRACKET FOR PICTURE FRAME OR THE LIKE
Charles W. Buchanan, Scottsdale, Ariz., assignor to William E. Sornborger, Los Angeles, Calif.
Filed Mar. 29, 1982, Ser. No. 363,020
Term of patent 14 years
U.S. Cl. D6—300

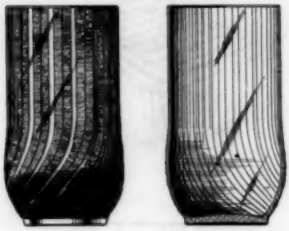
275,252
TUMBLER OR SIMILAR ARTICLE
Philippe J. Durand, Les Daneaux, Chemin de la Garenne, 62510 Arques, France
Filed Jun. 29, 1982, Ser. No. 393,449
Claims priority, application Hague, May 24, 1982, DM/001 481
Term of patent 14 years
U.S. Cl. D7—6

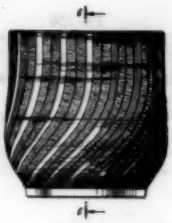
275,253
MUG OR SIMILAR ARTICLE
Philippe J. Durand, Les Daneaux, Chemin de la Garenne, 62510 Arques, France
Filed Jun. 17, 1982, Ser. No. 389,269
Claims priority, application Hague, May 24, 1982, DM/001 481
Term of patent 14 years
U.S. Cl. D7—9



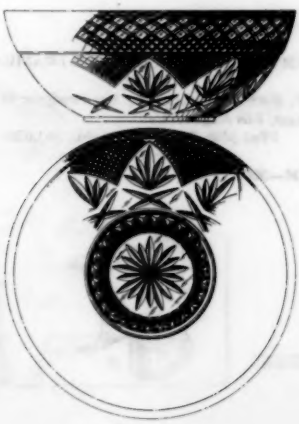


275,254
TUMBLER OR SIMILAR ARTICLE
Philippe J. Durand, Les Daneaux, Chemin de la Garenne, 62510 Arques, France
Filed Jun. 29, 1982, Ser. No. 393,450
Claims priority, application Hague, May 24, 1982, DM/001 481
Term of patent 14 years
U.S. Cl. D7—14

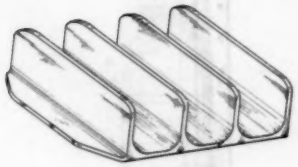


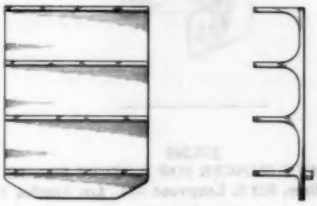


275,255
BOWL
Philippe J. Durand, Les Daneaux, Chemin de la Garenne, 62510 Arques, France
Filed Jul. 20, 1982, Ser. No. 400,156
Claims priority, application Hague, May 24, 1982, DM/001 481
Term of patent 14 years
U.S. Cl. D7—28



275,256
TACO HOLDER
Deana Gilliam, 7315 Sprague St., Anderson, Ind. 46013
Filed Jan. 11, 1982, Ser. No. 338,222
Term of patent 14 years
U.S. Cl. D7—76

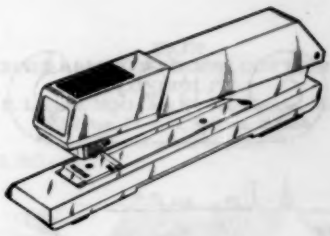




275,257
NOZZLE UNIT FOR AN INDUSTRIAL OVEN
David Rattner, Solebury, Pa., assignor to Aztec Machinery Company, Ivyland, Pa.
Filed Aug. 31, 1981, Ser. No. 297,710
Term of patent 14 years
U.S. Cl. D7—387

275,258
EMERGENCY ENTRANCE TOOL
Frank E. Albrecht, 308 Fairview Rd., Riegelsville, Pa. 18077
Filed May 12, 1982, Ser. No. 377,304
Term of patent 14 years
U.S. Cl. D8—17

275,259
STAPLING MACHINE
Lars G. Rosenblad, Grönna, Sweden, assignor to Isabergs Verkstads AB, Hestra, Sweden
Filed Dec. 14, 1981, Ser. No. 330,693
Claims priority, application Sweden, Jul. 6, 1981, 81-1522
Term of patent 14 years
U.S. Cl. D8—50

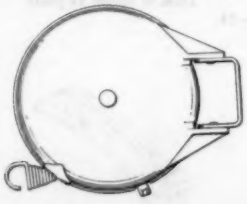


275,260
GLASS CUTTER HANDLER
Merlin C. Williams, 6387 Niwot Rd., Longmont, Colo. 80501, and Floyd H. Williams, 6799 S. Clermont, Littleton, Colo. 80120
Filed Oct. 5, 1981, Ser. No. 309,828
Term of patent 14 years
U.S. Cl. D8—51

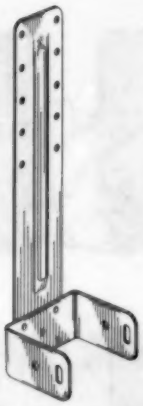
275,261
HAMMER
Thomas E. Crowder, 4558 Rosewell Rd., Atlanta, Ga. 30342
Continuation-in-part of Ser. No. 65,585, Aug. 10, 1979, Pat. No. Des. 267,469. This application Nov. 27, 1981, Ser. No. 325,123
Term of patent 14 years
U.S. Cl. D8—75

275,262
DEVICE FOR SECURING LOAD TIE DOWN ROPES
James F. Kimball, 83617 Rattlesnake Rd., Dexter, Oreg. 97431
Filed Jul. 6, 1982, Ser. No. 395,148
Term of patent 14 years
U.S. Cl. D8—356

275,263
CORD REEL
Morris Cutler, Wyndmoor, Pa., assignor to Ametek, Inc., New York, N.Y.
Filed Sep. 30, 1981, Ser. No. 307,063
Term of patent 14 years
U.S. Cl. D8—358



275,264
MOUNTING BRACKET FOR ATTACHING A SONAR TRANSDUCER TO A BOAT STERN
Joseph B. Wegener, II, Phoenix, Ariz., assignor to Above Water Mfg.
Filed Dec. 6, 1982, Ser. No. 447,173
Term of patent 14 years
U.S. Cl. D8—373



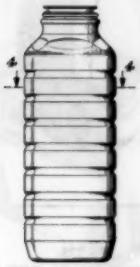
275,265
SNAP-LOCK HANGER FOR PICTURE FRAME
Robert S. Wallace, 823 S. Longwood Ave., Los Angeles, Calif. 90005
Filed May 26, 1981, Ser. No. 267,033
Term of patent 14 years
U.S. Cl. D8—382

275,266
BUCKLE AND STRAP ASSEMBLY
Akira Kawahara, Kagawa, Japan, assignor to Ryusyo Industrial Co., Ltd., Osaka, Japan
Filed Jul. 31, 1981, Ser. No. 288,930
Claims priority, application Japan, Apr. 9, 1981, 56/15263
Term of patent 14 years
U.S. Cl. D8—383

275,267
BOTTLE

Raoul L. Gautier, Belmont sur Vair, France, assignor to Societe Generale des Eaux Minerales de Vittel, Vittel, France

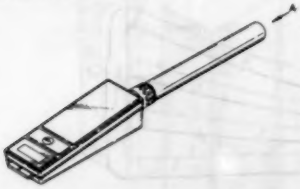
Filed Sep. 14, 1981, Ser. No. 302,260
Claims priority, application France, Mar. 16, 1981, 93
Term of patent 14 years
U.S. Cl. D9—406



275,268
PH METER, OR THE LIKE

James O. Molloy, and Peter E. Sydenham, both of London, England, assignors to Fisons Limited, Ipswich, England

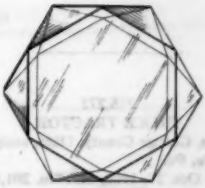
Filed Dec. 28, 1981, Ser. No. 335,267
Claims priority, application United Kingdom, Jul. 10, 1981, 4001415
Term of patent 14 years
U.S. Cl. D10—81



275,269
ORNAMENT

George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002

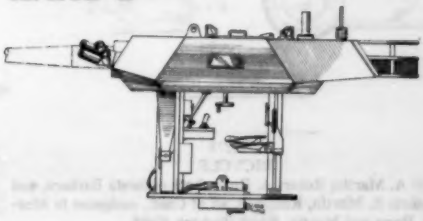
Filed Nov. 21, 1980, Ser. No. 208,936
Term of patent 14 years
U.S. Cl. D11—121

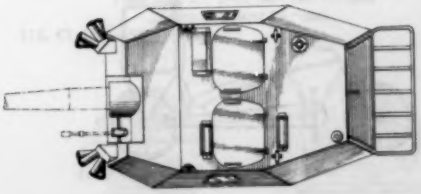


275,270
COMBINED ARMORED VEHICLE GUN TURRET AND CONTROL PIT

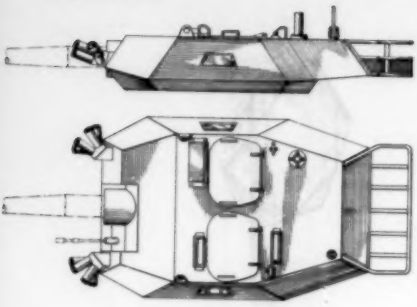
James C. LeBlanc, 38261 Long St., Mt. Clemens, Mich. 48045

Filed Apr. 22, 1981, Ser. No. 256,656
Term of patent 14 years
U.S. Cl. D12—12

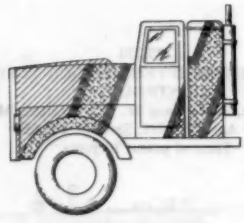




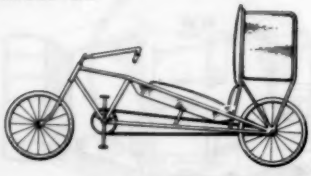
275,271
ARMORED VEHICLE GUN TURRET
James C. LeBlanc, 38261 Long St., Mt. Clemens, Mich. 48045
Filed Apr. 22, 1981, Ser. No. 256,657
Term of patent 14 years
U.S. Cl. D12—12



275,272
TRUCK TRACTOR
Leslie H. Bossinas, Geauga County, Ohio, assignor to Angesco, Inc., Murrysville, Pa.
Filed Oct. 27, 1980, Ser. No. 201,130
Term of patent 14 years
U.S. Cl. D12—96

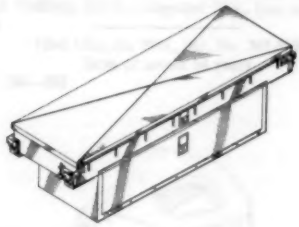


275,273
BICYCLE
Robert A. Martin; Robert A. Rowe, both of Santa Barbara, and Guthrie E. Martin, Redlands, all of Calif., assignors to Martin, Rowe and Martin, Santa Barbara, Calif.
Filed Dec. 3, 1982, Ser. No. 446,730
Term of patent 14 years
U.S. Cl. D12—111

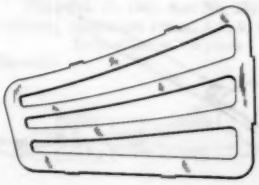


275,274
VEHICLE TIRE
Hiroshi Kojima, Tokyo; Hideaki Nishio, Saitama, and Koujiro Yamaguchi, Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Apr. 26, 1982, Ser. No. 372,260
Claims priority, application Japan, Oct. 27, 1981, 56-47508
Term of patent 14 years
U.S. Cl. D12—147

275,275
ROLLER SUSPENDED TOOL BOX FOR PICKUP TRUCKS OR THE LIKE
Carol E. Stapp, 3633 Heatsman Dr., Sacramento, Calif. 95826
Filed Feb. 12, 1982, Ser. No. 348,536
Term of patent 14 years
U.S. Cl. D12—157



275,276
FAIRING VENT
Thomas H. Rudd, Wayzata; Alwin J. Stabel, St. Paul, and James M. Preisler, Mound, all of Minn., assignors to Drag Specialties, Inc., Minnetonka, Minn.
Filed Jun. 3, 1982, Ser. No. 384,655
Term of patent 14 years
U.S. Cl. D12—182



275,277

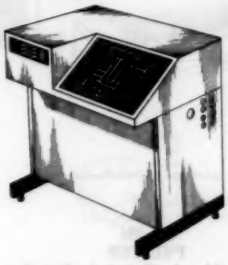
CONTROL CONSOLE FOR ION EXCHANGE UNIT THAT REGENERATES PHOTOGRAPHIC DEVELOPERS

Brian C. Barbo, Avon; Richard L. Klein, Rochester; Robert M. Kahute, Honeoye Falls, and Thomas N. Hendrickson, Perry, all of N.Y., assignors to CPAC, Inc., Leicester, N.Y.

Filed Feb. 22, 1982, Ser. No. 351,166

Term of patent 14 years

U.S. Cl. D13—12



275,278

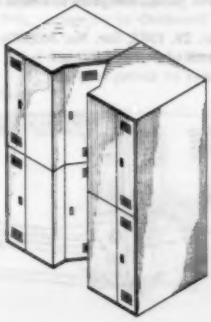
METAL CLAD SWITCHGEAR

Norman Davies, and Ronald E. Vaill, both of Irwin, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 12, 1982, Ser. No. 397,257

Term of patent 14 years

U.S. Cl. D13—40



275,279

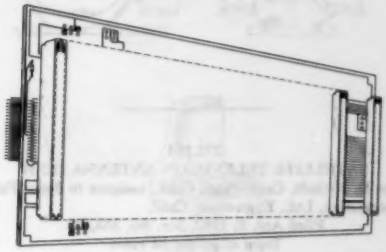
HIGH DENSITY COMPONENT MOUNTING BACK PANEL FOR ELECTRONIC EQUIPMENT

Bruce G. Littlefield, Honeoye Falls; Jerome S. Caplan, Henrietta, and Charles J. Breidenstein, Rochester, all of N.Y., assignors to Redcom Laboratories, Inc., Fairport, N.Y.

Filed Aug. 15, 1980, Ser. No. 178,641

Term of patent 14 years

U.S. Cl. D13—24



275,280

TELEPHONE

Steve D. Adams, Jr., 473 79th St. South, St. Petersburg, Fla. 33707

Filed Jan. 29, 1982, Ser. No. 343,962

Term of patent 14 years

U.S. Cl. D14—53

275,281

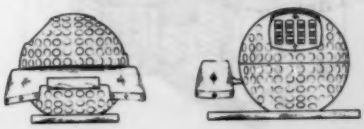
TELEPHONE

Steve D. Adams, Jr., 473 79th St. South, St. Petersburg, Fla. 33707

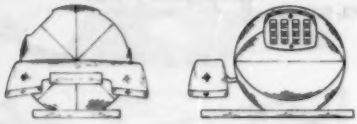
Filed Jan. 29, 1982, Ser. No. 343,963

Term of patent 14 years

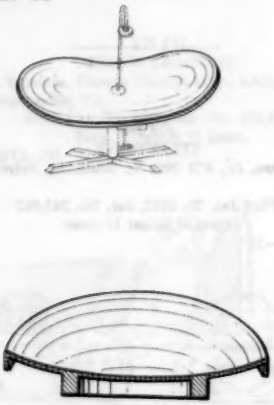
U.S. Cl. D14—53



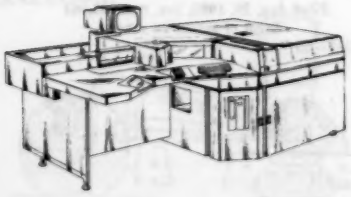
275,282
TELEPHONE
Steve D. Adams, Jr., 473 79th St., South, St. Petersburg, Fla. 33707
Filed Jan. 29, 1982, Ser. No. 343,964
Term of patent 14 years
U.S. Cl. D14—53



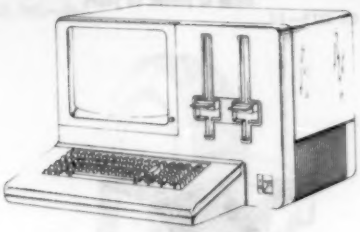
275,283
SATELLITE TELEVISION ANTENNA DISH
James D. Nichols, Carmichael, Calif., assignor to Jones Futura Foundation, Ltd., Englewood, Calif.
Filed Apr. 1, 1982, Ser. No. 364,615
Term of patent 14 years
U.S. Cl. D14—90



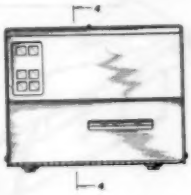
275,284
TERMINAL
Jon B. Wells, La Verne; Lamar M. Fidler, Upland; Dwight G. Westover, Sierra Madre; Ronald E. Loosen, Huntington Beach, and Charles M. Smith, Manhattan Beach, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.
Filed Jun. 8, 1981, Ser. No. 271,186
Term of patent 14 years
U.S. Cl. D14—104



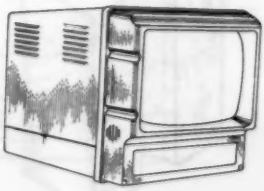
275,285
HOUSING FOR A TABLETOP COMPUTER
Tommy R. Hardy, Boca Raton, Fla., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Feb. 4, 1980, Ser. No. 117,914
Term of patent 14 years
U.S. Cl. D14—106



275,286
PRINTER
Gerhard Cless, Northbrook; Rafael A. Castellanos, Roselle; Albert L. Eischen, Arlington Heights, and David H. Bloom, Vernon Hills, all of Ill., assignors to Data Specialties, Inc., Northbrook, Ill.
Filed Aug. 25, 1982, Ser. No. 411,526
Term of patent 14 years
U.S. Cl. D14—111



275,287
CRT MONITOR HOUSING
David W. Jubola, Danvers; David B. Johns, Andover, and Yuri Kunimi, Groton, all of Mass., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Mar. 29, 1982, Ser. No. 363,088
Term of patent 14 years
U.S. Cl. D14—113



275,288

ELEVATOR HOISTING ENGINE

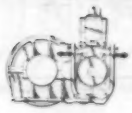
Satoru Yokota; Yasutaka Hirano, and Tamaiti Kondou, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 285,877, Jul. 23, 1981,. This application Sep. 16, 1983, Ser. No. 532,990

Claims priority, application Japan, Feb. 5, 1981, 56-4254; Feb. 5, 1931, 56-4256; Feb. 5, 1981, 56-4257; May 18, 1981, 56-21312; May 18, 1981, 56-21313; May 18, 1981, 56-21314; May 18, 1981, 56-21315

Term of patent 14 years

U.S. Cl. D15—1



275,289

MOUNTING BRACKET ASSEMBLY FOR AN OUTBOARD MOTOR

Arthur R. Ferguson, Northbrook, Ill., and Myron T. Stevens, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 30, 1982, Ser. No. 403,565

Term of patent 14 years

U.S. Cl. D15—4

275,290

MOUNTING BRACKET ASSEMBLY FOR AN OUTBOARD MOTOR

Arthur R. Ferguson, Northbrook, Ill., and Myron T. Stevens, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 30, 1982, Ser. No. 403,409

Term of patent 14 years

U.S. Cl. D15—4

275,291

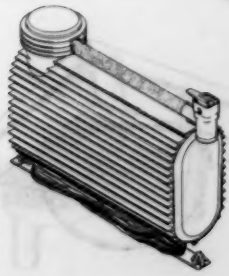
PORTABLE AIR COMPRESSOR

Jerald V. Dunlap, Pacific Palisades, Calif., assignor to M-D & Co., Mammoth Lakes, Calif.

Filed Sep. 13, 1982, Ser. No. 417,152

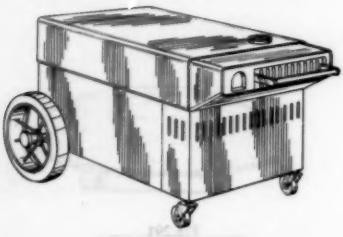
Term of patent 14 years

U.S. Cl. D15—9

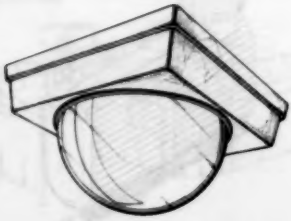


275,292
WELDING MACHINE
Mark H. Bouman, Burnsville, Minn., assignor to Century Mfg. Co., Minneapolis, Minn.
Filed Aug. 19, 1982, Ser. No. 409,727
Term of patent 14 years
U.S. Cl. D15—144

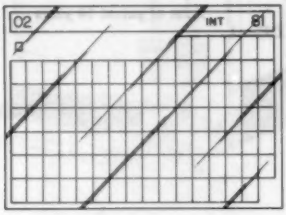
275,293
WELDING MACHINE
Mark H. Bouman, Burnsville, Minn., assignor to Century Mfg. Co., Minneapolis, Minn.
Filed Aug. 19, 1982, Ser. No. 409,580
Term of patent 14 years
U.S. Cl. D15—144



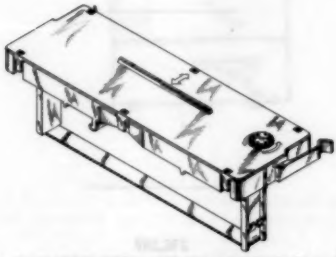
275,294
SURVEILLANCE CAMERA HOUSING
Raymond V. Pagano, 308 Superior Dr., Decatur, Ga. 30030
Filed Jul. 12, 1982, Ser. No. 397,205
Term of patent 14 years
U.S. Cl. D16—2



275,295
MICROFICHE
Hubert F. Gevers, 26, Hogenaardseweg, Ranst, Belgium
Filed Apr. 6, 1982, Ser. No. 365,901
Claims priority, application Belgium, Oct. 7, 1981, 02591-01-06
Term of patent 14 years
U.S. Cl. D16—26

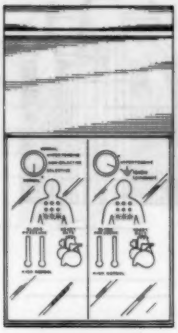


275,296
INK RIBBON CARTRIDGE
Chiharu Katori, Shiojiri, Japan, assignor to Epson Corporation, Nagano, Japan
Filed Jan. 27, 1983, Ser. No. 461,416
Claims priority, application Japan, Jul. 28, 1982, 57-34089
Term of patent 14 years
U.S. Cl. D18—12

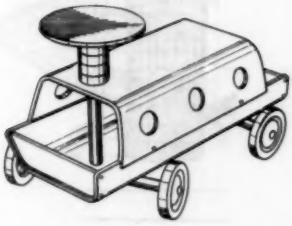


275,297
FELT PEN
Toshiharu Ohyabu, Nagoya, Japan, assignor to Shachihata Industrial Co., Ltd., Aichi, Japan
Filed Dec. 15, 1981, Ser. No. 330,802
Claims priority, application Japan, Jun. 24, 1981, 56-27585
Term of patent 14 years
U.S. Cl. D19—49

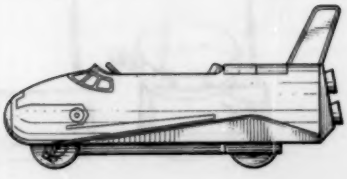
275,298
BETA BLOCKER DEMONSTRATION HOUSING OR THE LIKE
Alfred H. Wimmershoff, Westwood, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.
Filed Jan. 29, 1982, Ser. No. 344,177
Term of patent 14 years
U.S. Cl. D19—62



275,299
TOY VEHICLE
Nils A. I. Petersson, Killeberg, and Nils B. L. Sander, Osby, both of Sweden, assignors to Brio Toy AB, Osby, Sweden
Filed May 20, 1982, Ser. No. 380,101
Term of patent 14 years
U.S. Cl. D21—76

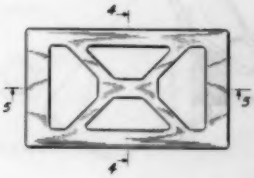


275,300
TOY VEHICLE
William F. Mancini, 1016 Karmont, South Gate, Calif. 90280
Filed Sep. 23, 1982, Ser. No. 421,948
Term of patent 14 years
U.S. Cl. D21—77



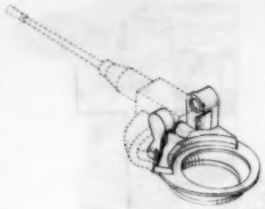
275,301
PUZZLE
C. Carey Cloud, P.O. Box 333, Nashville, Ind. 47448
Filed Nov. 27, 1981, Ser. No. 325,201
Term of patent 14 years
U.S. Cl. D21—105

275,302
HAND-HELD RESILIENT EXERCISE BLOCK
Thomas B. Rotella, 22 E. 7th St., Clifton, N.J. 07011
Filed Jan. 18, 1982, Ser. No. 340,088
Term of patent 14 years
U.S. Cl. D21—198



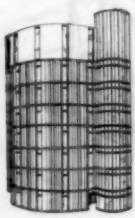
275,303
FOOTBALL TEE
Vester R. Box, Sr., 5908 Royal La., Dallas, Tex. 75230
Filed Aug. 2, 1982, Ser. No. 404,575
Term of patent 14 years
U.S. Cl. D21—209

275,304
CUPOLA FOR CANNON
Lawrence D. Bacon, Fountain Valley, Calif., assignor to Western Design Corporation, Irvine, Calif.
Filed Sep. 29, 1982, Ser. No. 426,763
Term of patent 14 years
U.S. Cl. D22—3

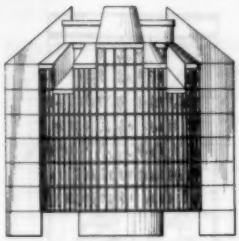


275,305
COMPACT HOLSTER
Richard D. E. Nichols, Fallbrook, Calif., assignor to Bianchi International, Temecula, Calif.
Filed Sep. 29, 1982, Ser. No. 427,871
Term of patent 14 years
U.S. Cl. D22—13

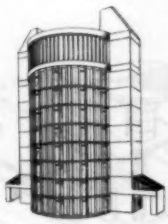
275,306
COMBINED WATER STORAGE TANK AND BUILDING
James M. Edwards, Brentwood, and John O. Cliff, Franklin, both of Tenn., assignors to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.
Filed Feb. 8, 1982, Ser. No. 346,762
Term of patent 14 years
U.S. Cl. D23—2



275,307
COMBINED WATER STORAGE TANK AND BUILDING
James M. Edwards, Brentwood, and John O. Cliff, Franklin, both of Tenn., assignors to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.
Filed Feb. 8, 1982, Ser. No. 346,939
Term of patent 14 years
U.S. Cl. D23—2



275,308
COMBINED WATER STORAGE TANK AND BUILDING
James M. Edwards, Brentwood, and John O. Cliff, Franklin, both of Tenn., assignors to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.
Filed Feb. 8, 1982, Ser. No. 346,937
Term of patent 14 years
U.S. Cl. D23—2

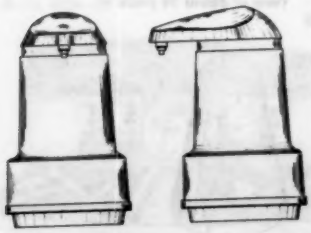


275,309
REGENERATIVE UNIT FOR COUNTER TOP WATER PURIFIERS
Bedford F. Stanley, 4901 E. Sunrise Dr., No. 1614, Tucson, Ariz. 85718
Filed May 17, 1982, Ser. No. 378,794
Term of patent 14 years
U.S. Cl. D23—3

275,310
COUNTER TOP WATER PURIFIER
Bedford F. Stanley, 4901 E. Sunrise Dr., No. 1614, Tucson, Ariz. 85718
Filed May 17, 1982, Ser. No. 378,796
Term of patent 14 years
U.S. Cl. D23—3

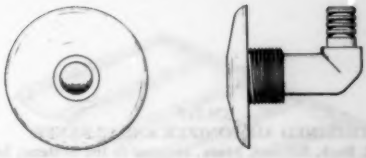
275,311
FLOAT FOR SWIMMING POOL CHLORINE DISPENSER
Henry S. Wolfe, St. Petersburg, Fla., assignor to Fredrich Thomas Industries, Inc., Clearwater, Fla.
Filed Oct. 28, 1983, Ser. No. 547,288
Term of patent 14 years
U.S. Cl. D23—3

275,312
WATER FILTER
Louis M. Ohls, 12101 E. 36 St., Tulsa, Okla. 74146
Filed Feb. 10, 1983, Ser. No. 465,554
Term of patent 14 years
U.S. Cl. D23—4

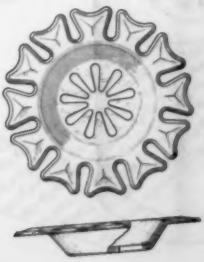


275,313
POP-UP SPRINKLER
Franco Clivio, Ulm, and Dieter Raffler, Neu-Ulm, both of Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Dec. 1, 1982, Ser. No. 445,902
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, GRA III 1034/82.03
Term of patent 14 years
U.S. Cl. D23—7

275,314
PLUMBING FITTING
Larry L. Cornell, 900 Leeward Dr., Chester, Va. 23831
Filed Jul. 12, 1982, Ser. No. 397,151
Term of patent 14 years
U.S. Cl. D23—40



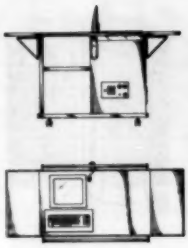
275,315
DISPOSAL STRAINER
Norton Sarnoff, Northbrook, and Carl R. Flectcher, Arlington Heights, both of Ill., assignors to Ensar Corporation, Wheeling, Ill.
Filed Feb. 8, 1982, Ser. No. 346,618
Term of patent 14 years
U.S. Cl. D23—42



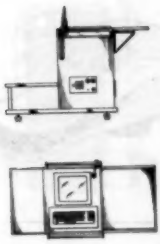
275,316
COUPLING ASSEMBLY
Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed Oct. 2, 1981, Ser. No. 307,957
Term of patent 14 years
U.S. Cl. D23—44

275,317
COMBINED AIR IONIZER AND CLEANER
Martin J. Beck, Boxford, Mass., assignor to Ion Systems, Inc., Berkeley, Calif.
Filed Aug. 4, 1982, Ser. No. 405,199
Term of patent 14 years
U.S. Cl. D23—149

275,318
APPARATUS FOR COLLECTING DATA ON ANIMAL EXPERIMENT
Masamitsu Okazaki, Yokohama, Japan, assignor to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan
Filed Dec. 8, 1981, Ser. No. 328,706
Claims priority, application Japan, Jun. 15, 1981, 56/26007
Term of patent 14 years
U.S. Cl. D24—1.1

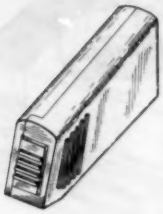


275,319
APPARATUS FOR COLLECTING DATA ON ANIMAL EXPERIMENTS
Masamitsu Okazaki, Yokohama, Japan, assignor to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan
Filed Dec. 8, 1981, Ser. No. 328,707
Claims priority, application Japan, Jun. 15, 1981, 56/26008
Term of patent 14 years
U.S. Cl. D24—1.1

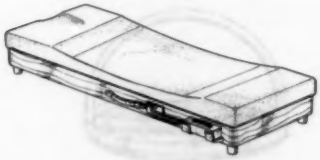


275,320
PROSTHETIC GAUGE
F. Joseph Halcomb, III, Warsaw, Ind., and C. Wayne Allen, Memphis, Tenn., assignors to Zimmer, Inc., Warsaw, Ind.
Filed Mar. 3, 1983, Ser. No. 471,966
Term of patent 14 years
U.S. Cl. D24—26

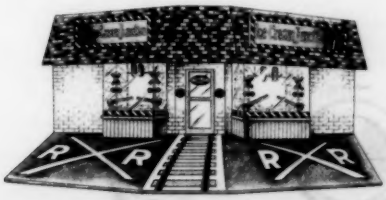
275,321
SURGICAL TAPE APPLICATOR
Bert D. Heinzelman, North Bergen, N.J.; Douglas M. Spranger; Malcolm J. Brookes, both of New York, N.Y., and John E. Kuphal, West Linn, Oreg., assignors to Shur Medical Corporation, Beaverton, Oreg.
Filed Mar. 3, 1982, Ser. No. 354,203
Term of patent 14 years
U.S. Cl. D24—34



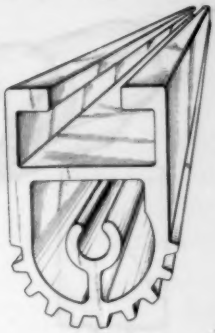
275,322
MASSAGE TREATMENT TABLE
Shinroku Nakao, Yokohama; Takashi Chino, and Katuhiro Tokutake, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Feb. 24, 1982, Ser. No. 351,692
Claims priority, application Japan, Sep. 25, 1981, 56-42510
Term of patent 14 years
U.S. Cl. D24—36



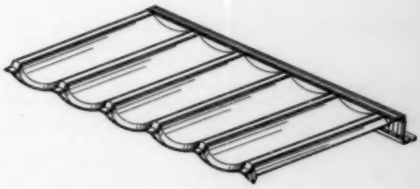
275,323
STORE FRONT
Michael Miczewski, 310 Springfield Ave., Westfield, N.J. 07090
Filed Sep. 10, 1980, Ser. No. 185,781
Term of patent 14 years
U.S. Cl. D25—59



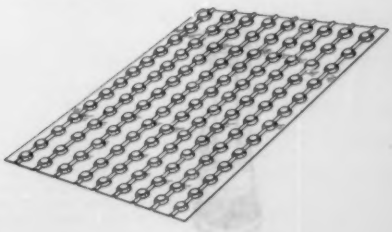
275,324
COUPLING FOR DECORATING PURPOSES
Olof B. Wahlin, Vastra Frolunda, Sweden, assignor to Foga System Internationaal AB, Vastra Frolunda, Sweden
Filed Jul. 22, 1982, Ser. No. 400,600
Claims priority, application Sweden, Feb. 8, 1982, 82-0268
Term of patent 14 years
U.S. Cl. D25—74



275,325
ROOF PANEL
Erik Gustavsson, Pimpelvägen 8, S-951 40 Luleå, Sweden
Filed Oct. 27, 1980, Ser. No. 201,230
Term of patent 14 years
U.S. Cl. D25—80



275,326
PROTECTIVE SHEET FOR A FOUNDATION WALL, A FLOOR OR THE LIKE
Jon Bergsland, Oslo, Norway, assignor to A/S Platon, Norway
Filed Jul. 26, 1982, Ser. No. 401,517
Claims priority, application Norway, Apr. 1, 1982, 62809
Term of patent 14 years
U.S. Cl. D25—94



275,327
COMPACT FLUORESCENT LAMP UNIT
Robert G. Young, Nutley; Edward W. Morton, Teaneck; Henry Skwirut, Verona, and Thomas E. Dooley, Clifton, all of N.J., assignors to North American Philips Electric Corp., New York, N.Y.
Division of Ser. No. 206,501, Nov. 13, 1980, Pat. No. Des. 271,424. This application Nov. 14, 1983, Ser. No. 551,650
Term of patent 14 years
U.S. Cl. D26—3

275,328
COMBINED FAN AND TORCH
Chui Yin, and Siu Tong, both of Kowloon, Hong Kong, assignors to Lung Sun Plastic & Metal Factory Limited, Hong Kong
Filed Feb. 9, 1982, Ser. No. 347,368
Claims priority, application United Kingdom, Oct. 26, 1981, 1003205
Term of patent 14 years
U.S. Cl. D26—38

275,329
COMB
Joseph Giuliano, 7 Stage Coach La., Newington, Conn. 06111
Filed May 24, 1982, Ser. No. 381,718
Term of patent 14 years
U.S. Cl. D28—30

275,330
HAIR CLIP HOLDER
Quintealya W. Bryant, 1909 Burr Blvd., Flint, Mich. 48503
Filed Jul. 21, 1981, Ser. No. 285,518
Term of patent 14 years
U.S. Cl. D28—75

275,331
ANIMAL EAR TAG INSECTICIDE DISPENSER
Francis W. Child, 1307 Southfork Rd., Cody, Wyo. 82414
Filed Oct. 5, 1981, Ser. No. 308,923
Term of patent 14 years
U.S. Cl. D30—99

275,332

MACHINE FOR WASHING GLASSES

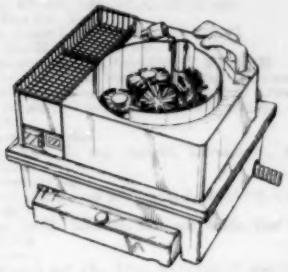
Kenneth J. Boyer, Fleet, England, assignor to Clenaglass Electric Limited, Hampshire, England

Filed Jun. 1, 1982, Ser. No. 383,467

Claims priority, application United Kingdom, Dec. 15, 1981, 1004153

Term of patent 14 years

U.S. Cl. D32—2



275,333

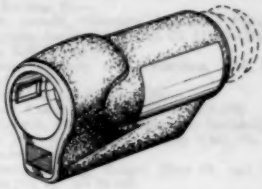
VACUUM CLEANER HOSE END FITTING

James Williams, Abbeville, and Henry K. Wills, Greenwood, both of S.C., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Aug. 26, 1982, Ser. No. 412,023

Term of patent 14 years

U.S. Cl. D32—31



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TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF AUGUST, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Dziedzic, Edward, 4,467,575, Cl. 52-157.000.

A. Finkl & Sons Co.: *See*—
Lehman, Albert L., 4,468,249, Cl. 75-124.000.

A Romheld GmbH & Co. KG: *See*—
Staudenmaier, Siegfried, 4,468,019, Cl. 269-56.000.

Aalberse, Robertus C., to Stichting Centraal Laboratorium van de Bloedtransfusiedienst van het Nederlandse Rode Kruis. Method and a kit for the assay of antibodies to soluble antigens. 4,468,470, Cl. 436-539.000.

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Murphy, John C.; and Aamodt, Leonard C., 4,468,136, Cl. 374-45.000.

AB Scaniainventor: *See*—
Siwersson, Olle L.; and Wall, Arne E., 4,467,910, Cl. 198-518.000.

AB Volvo: *See*—
Rydquist, Jan E.; Sandberg, Lars; and Wallin, Ralf, 4,467,607, Cl. 60-602.000.

Abe, Akira: *See*—
Iwao, Noriaki; and Abe, Akira, 4,467,556, Cl. 446-230.000.

Abe, Shinya: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, 4,468,458, Cl. 435-134.000.

Abraham, Michel, to Precision Mechanique Labinal. Device for measuring a parameter on a rotary element, and in particular for measuring the pressure of a pneumatic tire on a wheel. 4,467,641, Cl. 73-146.500.

Abys, Joseph A.; and Okinaka, Yutaka, to AT&T Bell Laboratories. Process for electroplating palladium. 4,468,296, Cl. 204-47.000.

ACF Industries, Incorporated: *See*—
Le, Tri C.; Meyer, Danny S.; and Williams, John B., 4,468,039, Cl. 277-112.000.

Achilles Corporation: *See*—
Nagatake, Hiroshi; and Hayashi, Keiji, 4,467,484, Cl. 5-449.000.

Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, to Dynamit Nobel AG. Method of preparing alkoxymethylene compounds. 4,468,353, Cl. 260-465.400.

Ackermann, Wilhelm, to Mannesmann Aktiengesellschaft. Torque support. 4,467,666, Cl. 74-411.000.

Adachi, Shichiro; and Kotani, Sho, to TDK Corporation. Electric soldering iron having a PTC heating element. 4,468,555, Cl. 219-237.000.

Adachi, Takato, to E.D.M. Corporation. Method and apparatus for bonding thermosensitive adhesive label. 4,468,274, Cl. 156-320.000.

Adamache, Ion, to Canterra Energy Ltd. Enhanced oil recovery by a miscibility enhancing process. 4,467,868, Cl. 166-263.000.

Adams, Bruce M. Airfoil surface multistate precipitation removal tool. 4,467,490, Cl. 15-105.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,468,488, Cl. 524-99.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Enzmann, Dieter R.; and Lundquist, Ingemar, 4,468,224, Cl. 604-247.000.

Advanced Micro Devices, Inc.: *See*—
Bayman, Atiye; and Thomas, Mammen, 4,468,285, Cl. 156-643.000.

Advanced Technologies, Inc.: *See*—
Morley, John D., 4,468,552, Cl. 219-121.0EC.

AE PLC: *See*—
Plant, Robert, 4,468,040, Cl. 277-140.000.

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Mori, Shunji; Yamada, Hiromitsu; Takeuchi, Kunihiko; and Do, Michihisa, 4,468,808, Cl. 382-20.000.

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Isogai, Kiyoshi; Koga, Ituo; Yamada, Yutaka; and Haruta, Kazumi, 4,467,750, Cl. 123-188.00M.

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Watanabe, Yukihiro, 4,467,748, Cl. 123-179.00G.

Aisin Seiki Kabushiki Kaisha: *See*—
Hattori, Kenji; Aoki, Kongou; and Hayashi, Masaharu, 4,467,901, Cl. 192-52.000.
Hayashi, Masaharu; Nakagawa, Makoto; and Hattori, Kenji, 4,467,903, Cl. 192-58.00B.
Yukimoto, Kazuyoshi; Mori, Keiji; and Masuda, Mitsuyoshi, 4,468,063, Cl. 296-223.000.

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Kawamoto, Mutsumi, 4,467,669, Cl. 74-688.000.
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Akiyama, Susumu: *See*—
Suzuki, Atsushi; Ninomiya, Masakazu; Fukaya, Hiroyasu; and Akiyama, Susumu, 4,467,765, Cl. 123-419.000.

Akkerman, Neil H.: *See*—
Vazquez, Gonzalo; and Akkerman, Neil H., 4,467,866, Cl. 166-117.500.

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Zwiener, Rudolf, 4,467,841, Cl. 139-429.000.

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Akzona Incorporated: *See*—
Eisenhuth, Ludwig; Zengel, Hans G.; and Bergfeld, Manfred, 4,468,526, Cl. 564-76.000.
Kramers, Aloysius A. J., 4,467,595, Cl. 57-225.000.

Albanese, James A.: *See*—
Falge, John J.; Albanese, James A.; Loran, Arthur W.; and Locklin, E. Alan, 4,467,574, Cl. 52-106.000.

Alberts, Heinrich: *See*—
Steinberger, Helmut; and Alberts, Heinrich, 4,468,491, Cl. 524-493.000.

Alcorta, Jorge A.; and Kildea, Robert J., to United Technologies Corporation. Oil capture scoop. 4,468,066, Cl. 308-187.000.

Alden, Dale E.: *See*—
Fokos, Robert F.; and Alden, Dale E., 4,467,687, Cl. 83-674.000.

Aldenhoven, Ghislanus M. A. M.: *See*—
Schoenmakers, Johannes J. M.; and Aldenhoven, Ghislanus M. A. M., 4,468,711, Cl. 360-96.300.

Aldous, Derek R.; and Melling, Robert J., to British Telecommunications. Stabilizing apparatus. 4,467,726, Cl. 104-246.000.

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Funk, James E., 4,468,232, Cl. 44-51.000.

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Allen Tool Company, Inc.: *See*—
Allen, David O., 4,467,938, Cl. 220-270.000.

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Degrassi, Alfieri; Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; and Mason, Charles D., 4,468,427, Cl. 428-220.000.
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Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., 4,468,182, Cl. 425-7.000.
Byrne, Stephen C.; and Vasudevan, Asuri K., 4,468,298, Cl. 204-60.000.
Byrne, Stephen C.; Ray, Siba P.; and Rapp, Robert A., 4,468,299, Cl. 204-60.000.
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Misra, Chanakya, 4,468,375, Cl. 423-122.000.
Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., 4,468,183, Cl. 425-7.000.

Amax Inc.: *See*—
Parker, Peter D.; and Frueh, Eric L., 4,468,302, Cl. 204-108.000.

AMCA International Corporation: *See*—
Long, Gene M.; DeWitt, Terry E.; and Bell, III: John R., 4,467,586, Cl. 52-748.000.

American Can Company: *See*—
Wilkinson, Harlen E.; and Sopher, Theodore, 4,467,933, Cl. 220-66.000.

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Callahan, Francis M.; Miner, Thomas G.; and Bernstein, Seymour, 4,468,385, Cl. 424-180.000.
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American District Telegraph Company: *See*—
Galvin, Aaron A.; Guscott, John K.; Henderson, Martin E.; and Harvey, Roy L., 4,468,664, Cl. 340-825.690.

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American Hoist of Canada Limited: *See*—
McGhie, James R.; and Fishgal, Semyon I., 4,468,047, Cl. 280-419.000.

American Home Products Corporation: *See*—
Phillipps, Patrick G.; and Fairchild, William G., 4,468,678, Cl. 346-139.00R.

American Metal Door Company, Inc.: *See*—
Hemmerling, Gene A., 4,467,562, Cl. 49-411.000.

American Microsystems, Inc.: *See*—
Riebeek, Gerardus F., 4,468,798, Cl. 377-57.000.

American Sterilizer Company: *See*—
Hutchinson, John W., 4,467,830, Cl. 137-590.000.
Makhijani, Raju T., 4,467,936, Cl. 220-246.000.

American Tourister, Inc.: *See*—
Zampini, Louis, Jr., 4,467,628, Cl. 70-312.000.

Amiot, Jacques H. J., to Moulinex, Societe Anonyme. Domestic coffee maker. 4,467,707, Cl. 99-279.000.

AMP Incorporated: *See*—
John, Waldemar; and Tucci, John J., 4,467,516, Cl. 29-566.400.

Ampex Corporation: *See*—
Coleman, Charles H., Jr., 4,468,708, Cl. 358-310.000.
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Sinclair, Stuart W., 4,467,894, Cl. 187-17.000.

Anderson-Cook, Inc.: *See*—
Killop, James T., 4,467,631, Cl. 72-88.000.

Anderson, Robert W., Jr.: *See*—
Fogarty, John E., Jr.; and Anderson, Robert W., Jr., 4,468,322, Cl. 210-236.000.

Anderson, Ronald W.: *See*—
Hines, Gordon E.; Anderson, Ronald W.; and Henke, Arthur W., 4,467,650, Cl. 73-483.000.

Andis Company: *See*—
Andis, Matthew L., 4,468,554, Cl. 219-222.000.

Andis, Matthew L., to Andis Company. Electric hair curling appliance having a selectively rotatable removable hair grooming member. 4,468,554, Cl. 219-222.000.

Andy Boyd Company, The: *See*—
Boyd, Andrew B., 4,467,825, Cl. 137-112.000.

Angelo, Lawrence F.: *See*—
Satterwhite, Lawrence E.; and Angelo, Lawrence F., 4,467,833, Cl. 137-637.000.

Anglo-American Clays Corporation: *See*—
Turner, Ralph E., Jr., 4,468,317, Cl. 209-5.000.

Anic S.p.A.: *See*—
Chiusoli, Gian Paolo; Costa, Mirco; Pallini, Luciano; and Terenghi, Giuliana, 4,468,522, Cl. 560-155.000.

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Voronkov, Mikhail G.; Platonova, Ada T.; Annenkova, Vladislava Z.; Annenkova, Valentina M.; Kazimirovskaya, Valentina B.; and Ugrjumova, Galina S., 4,468,378, Cl. 424-81.000.

Annenkova, Vladislava Z.: *See*—
Voronkov, Mikhail G.; Platonova, Ada T.; Annenkova, Vladislava Z.; Annenkova, Valentina M.; Kazimirovskaya, Valentina B.; and Ugrjumova, Galina S., 4,468,378, Cl. 424-81.000.

Anspach, William E., Jr.: *See*—
Kuzmick, Kenneth M.; and Anspach, William E., Jr., 4,468,217, Cl. 604-48.000.

Anstedt, Charles T. Smoker grill attachment. 4,467,709, Cl. 99-482.000.

Antle, Paul E.; Schmit, John A.; and Smith, Edward L., to Du Pont de Nemours, E. I., and Company. Method and system for liquid choromatography separations. 4,468,331, Cl. 210-659.000.

Antognini, Luciano; and Remus, Hans-Jurgen, to Asulab S.A. Method for reducing the consumption of a stepping motor and device for performing the method. 4,468,602, Cl. 318-696.000.

Anvil Corporation: *See*—
Huggins, Ronald D., 4,467,682, Cl. 82-73.000.

Aoki, Kongou: *See*—
Hattori, Kenji; Aoki, Kongou; and Hayashi, Masaharu, 4,467,901, Cl. 192-52.000.

Aoyagi, Kenichi: *See*—
Namba, Yuzuru; and Aoyagi, Kenichi, 4,467,760, Cl. 123-308.000.

Applied Polymer Technology, Incorporated: *See*—
Baker, Richard L., 4,467,837, Cl. 138-119.000.

Arai, Akira. Variable mask device for an illuminator. 4,468,720, Cl. 362-281.000.

Arai, Takayuki: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.

Arai, Yasunori: *See*—
Itoh, Takayuki; and Arai, Yasunori, 4,468,100, Cl. 350-463.000.

Arai, Yoshio: *See*—
Fujiwara, Fukumi; and Arai, Yoshio, 4,468,703, Cl. 358-282.000.

Araki, Hidejiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for controlling the roving take-up tension in a roving machine. 4,467,592, Cl. 57-96.000.

Araki, Hidejiro, to Seisakusho Kabushiki Kaisha Toyoda Jidoshokki. Method and apparatus for automatically controlling winding tension of a roving in a roving machine. 4,467,593, Cl. 57-96.000.

Araki, Yasuhiko: *See*—
Kamiyama, Fumio; Kohara, Minoru; Nagata, Mituo; and Araki, Yasuhiko, 4,468,330, Cl. 210-656.000.

Araki, Yoshihiko: *See*—
Yokoyama, Nobuo; and Araki, Yoshihiko, 4,468,254, Cl. 106-271.000.

Arata, Ryozo: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,468,488, Cl. 524-99.000.

Arbree, Roberta R.; Foley, James W.; and Meneghini, Frank A., to Polaroid Corporation. Photographic products and processes. 4,468,449, Cl. 430-222.000.

Arc Technologies Systems Ltd.: *See*—
Bauer, Hanns G.; Zollner, Dieter H.; Otto, Josef; Muhlenbeck, Josef; Rittmann, Friedrich; Conradty, Claudio; Lauterbach-Dammler, Inge; and Sonke, Horst, 4,468,783, Cl. 373-93.000.

Arditty, Herve J.: *See*—
Papuchon, Michel; Arditty, Herve J.; and Puech, Claude, 4,468,085, Cl. 350-96.140.

Arias, Henry: *See*—
Kulesza, Ralph J.; Kulesza, Wayne A.; Arias, Henry; and Disko, Harry, 4,468,029, Cl. 273-108.000.

Arikawa, Junichi: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,468,068, Cl. 312-333.000.

Arimura, Takashi; Yamazoe, Hisamitsu; and Matsumura, Toshimi, to Nippondenso Co., Ltd. Method and apparatus for controlling the air-fuel ratio in an internal combustion engine. 4,467,770, Cl. 123-489.000.

Armco Inc.: *See*—
Neiheisel, Gary L., 4,468,551, Cl. 219-121.00L.

Armstrong, Beverly W. Ventilation tube for the middle ear and method of implanting same. 4,468,218, Cl. 604-49.000.

Arnosky, Joseph E., to Park-Ohio Industries, Inc. Induction heater arrangement for forging bar stock. 4,468,549, Cl. 219-10.770.

Arsovic, Hans M., to Societe Agricole et Fonciere S.A.F.S.A. Plant for treating manures. 4,468,463, Cl. 435-316.000.

Artman, Noel G. Combined air intake passage and precombustion chamber for internal combustion engine. 4,467,759, Cl. 123-263.000.

Artz, Glen D.; and Grant, Louis R., to United States of America, Army. Solid propellant hydrogen generator. 4,468,263, Cl. 149-22.000.

Asada, Atsushi; Morinaga, Hisao; and Saiji, Mitsuhiro, to Sharp Kabushiki Kaisha. Electronic translator for selecting cursor position to input new words. 4,468,754, Cl. 364-900.000.

Asahi Glass Company Ltd.: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Matsubara, Toshiya, 4,468,301, Cl. 204-98.000.
Takeda, Ryuichiro; and Fujita, Naoaki, 4,468,429, Cl. 428-283.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kuboyama, Keiji; Matsui, Takeki; and Kimura, Takeo, 4,468,415, Cl. 427-91.000.
Nakamura, Shohei; and Kinoshita, Nobuyasu, 4,468,453, Cl. 430-269.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Itoh, Takayuki, 4,468,098, Cl. 350-427.000.
Itoh, Takayuki; and Arai, Yasunori, 4,468,100, Cl. 350-463.000.

Asaka, Urataro; Kurata, Noboru; and Masumura, Masanori, to Honda Giken Kogyo Kabushiki Kaisha. Sealing structure of a rotary valve in an internal combustion engine. 4,467,751, Cl. 123-190.00E.

Asano, Hiroshi; Shimamune, Takayuki; and Nitta, Hideo, to Permelec Electrode Ltd. Electrolytic electrodes having high durability and process for the production of same. 4,468,416, Cl. 427-126.500.

Asanuma, Tadashi: *See*—
Kaneko, Masahiro; Asanuma, Tadashi; Uchikawa, Nobutaka; Fujio, Ichiro; and Shiomura, Tetsunosuke, 4,468,257, Cl. 134-22.130.

ASEA Aktiebolag: *See*—
Stenkvist, Sven-Einar, 4,468,782, Cl. 373-84.000.
Valdemarsson, Stefan, 4,467,662, Cl. 73-862.690.

Asulab S.A.: *See*—
Antognini, Luciano; and Remus, Hans-Jurgen, 4,468,602, Cl. 318-696.000.
Bui, Ngoc C.; and Simonet, Daniel, 4,468,131, Cl. 368-69.000.

AT&T Bell Laboratories: *See*—
Abys, Joseph A.; and Okinaka, Yutaka, 4,468,296, Cl. 204-47.000.
Blank, Stuart L.; and Rana, Virendra V. S., 4,468,438, Cl. 428-692.000.
Duttweiler, Donald L.; Gritton, Charles W. K.; and Tao, Ying G., 4,468,641, Cl. 333-166.000.
Gritton, Charles W. K., 4,468,640, Cl. 333-166.000.
Liu, Pao-Lo P., 4,468,086, Cl. 350-96.140.
Starr, Thomas J. J., 4,468,612, Cl. 324-66.000.
Wang, Chung C., 4,468,728, Cl. 364-200.000.

AT&T Technologies, Inc.: *See*—
Bice, Chester L., 4,468,118, Cl. 356-73.100.
Chisholm, William M., 4,467,523, Cl. 29-845.000.
Meal, John R.; and Wiklund, Gordon M., 4,468,069, Cl. 339-6.00A.
Reece, Carla F.; and Vanacore, Vincent D., 4,468,528, Cl. 179-18.00B.
Shaw, Jonathan L., 4,467,891, Cl. 182-210.000.

Atago, Takeshi; and Manaka, Toshio, to Hitachi, Ltd. Single point electronic fuel injection system. 4,467,771, Cl. 123-490.000.

Atkinson, David C.; Carrico, Robert J.; and Morris, David L., to Miles Laboratories, Inc. Substituted phenylacetic acids and salts as TBP blocking agents in iodothyronine immunoassays. 4,468,469, Cl. 436-500.000.

Atlantic Richfield Company: *See*—
Bender, David L.; and Rea, Samuel N., 4,468,280, Cl. 156-624.000.
Bender, David L.; and Rea, Samuel N., 4,468,281, Cl. 156-624.000.
Leonard, John J.; and Sofranko, John A., 4,468,523, Cl. 560-204.000.
Skinner, James L., 4,467,531, Cl. 34-10.000.

Aubert, Christian B., to S.N.E.C.M.A. Air-cooled annular friction and seal device for turbine or compressor impeller blade system. 4,468,168, Cl. 415-116.000.

Auckland Province Inc.: *See*—
McCallum, Bruce D.; and McCallum, Scott J., 4,467,890, Cl. 182-206.000.

August Krempel Soehne GmbH & Co.: *See*—
Kuemmel, Robert, 4,468,504, Cl. 525-406.000.

Automation Industries, Inc.: *See*—
Van Brunt, Michael K., 4,468,080, Cl. 339-136.00R.

AVA International, Inc.: *See*—
Vazquez, Gonzalo; and Akkerman, Neil H., 4,467,866, Cl. 166-117.500.

Avco Everett Research Laboratory, Inc.: *See*—
Itzkan, Irving, 4,468,279, Cl. 156-617.0SP.

Ayerst, McKenna & Harrison, Inc.: *See*—
Voith, Katherine, 4,468,391, Cl. 424-244.000.

Azulai, Max; Bar-Nefy, Simcha; and Tiomkin, Michael, to Israel Aircraft Industries, Ltd. Mine field clearing apparatus. 4,467,694, Cl. 89-1.00M.

B. F. Goodrich Company, The: *See*—
Kramer, James H.; Orndorff, Roy L., Jr.; Stephens, James M.; and Presutto, Vincent T., 4,468,056, Cl. 285-281.000.

B.T.P. Cocker Chemicals Limited: *See*—
Peacock, Jonathan H. B.; and Kurtz, John B., 4,468,332, Cl. 210-755.000.

Baba, Masanao, to Nippon Cable System, Inc. Fitting structure of steering wheel mechanism. 4,467,667, Cl. 74-493.000.

Babb, Bruce E.; and Dappen, Glen M., to Eastman Kodak Company. Diazonium salt for bilirubin assay. 4,468,467, Cl. 436-97.000.

Babbage, Thomas A.; and Cousins, Frederick W., to Trianco Redfyre Limited. Coal and wood burning stoves. 4,467,778, Cl. 126-77.000.

Babbitt, Richard W.: *See*—
Stern, Richard A.; Babbitt, Richard W.; and Borowick, John, 4,468,673, Cl. 343-785.000.

Babcock & Wilcox Company, The: *See*—
Smith, Robert C., 4,468,000, Cl. 251-84.000.

Bacha, Patricia; Reichlin, Seymour; and Murphy, John R., to New England Medical Center, Inc. Polypeptide-toxin hybrid protein. 4,468,382, Cl. 424-177.000.

Bachmann, Peter K., to U.S. Philips Corporation. Method of manufacturing fluorine-doped optical fibers. 4,468,413, Cl. 427-39.000.

Backer, Simon; and Smith, Michael T., to Canada, Atomic Energy of, Limited. Random coil ultrasonic seal. 4,467,935, Cl. 220-214.000.

Bailes, Robert B. Armchair reading stand. 4,467,991, Cl. 248-447.100.

Bajaj, Manohar C.: *See*—
Sakowski, Walter J.; Bajaj, Manohar C.; and Duncan, Budd L., 4,468,377, Cl. 423-474.000.

Baker, John R., to Baker Oil Tools, Inc. Subterranean well safety valve with reference pressure chamber. 4,467,867, Cl. 166-188.000.

Baker, Lewin T.; Bose, Sanjay K.; Ellis, George W.; and Puckette, Charles M., to General Electric Company. Method and apparatus for data transmission using chirped frequency-shift-keying modulation. 4,468,792, Cl. 375-45.000.

Baker Oil Tools, Inc.: *See*—
Baker, John R., 4,467,867, Cl. 166-188.000.
Langham, Ronald F., 4,467,870, Cl. 166-321.000.

Baker, Richard L., to Applied Polymer Technology, Incorporated. Lined hose including a thermoplastic liner bonded to a casing by hot melt adhesive. 4,467,837, Cl. 138-119.000.

Ban, Tenji; Mochizuki, Kazuo; Sakamoto, Yasuhei; and Harada, Shunichi, to Kawasaki Steel Corporation. Production of highly rust resistant tinplate sheets for welded cans. 4,468,292, Cl. 204-27.000.

Bansal, Jai P.; Bertin, Claude L.; and Troutman, Ronald R., to International Business Machines Corporation. Process for fabrication of stacked, complementary MOS field effect transistor circuits. 4,467,518, Cl. 29-571.000.

Bar-Nefy, Simcha: *See*—
Azulai, Max; Bar-Nefy, Simcha; and Tiomkin, Michael, 4,467,694, Cl. 89-1.00M.

Barbee, J. Brent, to Kanetsu Kogyo Kabushiki Kaisha. Low tire pressure alarm system. 4,468,650, Cl. 340-58.000.

Barch, Daniel R.: *See*—
Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., 4,468,182, Cl. 425-7.000.
Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., 4,468,183, Cl. 425-7.000.

Barda, Henry J., to Ethyl Corporation. Ester and halogen containing polyols. 4,468,479, Cl. 521-171.000.

Barda, Henry J., to Ethyl Corporation. Ester and halogen containing polyols. 4,468,480, Cl. 521-171.000.

Barda, Henry J.; Sutker, Burton J.; and Eldridge, William J., to Ethyl Corporation. Flame retardant polyurethane modified polyisocyanurate. 4,468,481, Cl. 521-171.000.

Barda, Henry J.; Sutker, Burton J.; and Eldridge, William J., to Ethyl Corporation. Flame retarded polyisocyanurate foam made from polyol derived from halogen containing dicarboxylic acid anhydride. 4,468,482, Cl. 521-171.000.

Bardos, Thomas J.; Cheng, Yung-Chi; and Schroeder, Alan C., to Research Foundation of State University of New York, The. Method for the inhibition of the replication of DNA viruses with 5-substituted 2-pyrimidinoae nucleosides. 4,468,384, Cl. 424-180.000.

Barger, Dale M., to Varian Associates, Inc. Magnetic circuit adjustable by tapered screws. 4,468,643, Cl. 333-202.000.

Barlow, Gordon A.; and Krutsch, John R., to Gordon Barlow Design. Three-dimensional game with rotatable track pieces for self-propelled vehicle. 4,468,031, Cl. 273-110.000.

Barthel, Richard C.; and Roy, Richard D., to Singer Company, The. Appliance controller. 4,468,600, Cl. 318-452.000.

Bartok, William; Freund, Howard; and Liotta, Ronald, to Exxon Research and Engineering Co. Cation ion exchange of coal. 4,468,231, Cl. 44-1.00R.

Barton, Derek H. R.; Bronstein-Bonte, Irena Y.; and Taylor, Lloyd D., to Polaroid Corporation. Polymeric pH-sensitive optical filter agents having hydrazone moieties attached thereto. 4,468,494, Cl. 525-353.000.

BASF Aktiengesellschaft: *See*—
Naarmann, Herbert; Kohler, Gernot; and Schlag, Johannes, 4,468,291, Cl. 204-13.000.
Naarmann, Herbert; Muench, Volker; and Franz, Klaus-Dieter, 4,468,509, Cl. 526-284.000.
Romberg, Helmut, 4,468,315, Cl. 208-10.000.
Weitz, Hans-Martin; and Fischer, Rolf, 4,468,525, Cl. 560-244.000.

BASF Wyandotte Corporation: *See*—
Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., 4,468,478, Cl. 521-125.000.

Bastenhof, Dirk, to Ecopool Design Limited. Pneumatic wave generator. 4,467,483, Cl. 4-491.000.

Batcheller, Barry D.; and Martinson, William E., to Steiger Tractor, Inc. Environmental control for tractor cab. 4,467,706, Cl. 98-1.500.

Battelle-Institut e.V.: *See*—
Schluter, Gert; and Stahl, Jurgen, 4,467,816, Cl. 128-756.000.

Battelle Memorial Institute: *See*—
Patten, James W.; Moss, Ronald W.; and McClanahan, Edwin D., 4,468,437, Cl. 428-553.000.

Bauer, Hanns G.; Zollner, Dieter H.; Otto, Josef; Muhlenbeck, Josef; Rittmann, Friedrich; Conradty, Claudio; Lauterbach-Dammler, Inge; and Sonke, Horst, to Arc Technologies Systems Ltd. Electrode for arc furnaces. 4,468,783, Cl. 373-93.000.

Bauer, Heinz, to Bauer Kompressoren GmbH. Apparatus and method for monitoring the service life of adsorption cartridges used for desiccating and/or cleansing moist pressurized air. 4,468,236, Cl. 55-20.000.

Bauer Kompressoren GmbH: *See*—
Bauer, Heinz, 4,468,236, Cl. 55-20.000.

Baugh, Benton F. Valve apparatus. 4,467,996, Cl. 251-1.00A.

Baumard, Rene ; Erckelboudt, Andre ; Moulin, Bernard; and Robin, Remi, to Faiveley S.A. Method for regulating the power supply to a direct-current motor and a device for the application of said method. 4,468,597, Cl. 318-317.000.

Baumoel, Joseph. Transducer having metal housing and employing mode conversion. 4,467,659, Cl. 73-861.270.

Baxter Travenol Laboratories, Inc.: *See*—
Carveth, Peter, 4,467,588, Cl. 53-425.000.
Di Gianfilippo, Aleandro; and Figler, Alan A., 4,467,844, Cl. 141-1.000.
Schnell, William J.; Fowles, Thomas A.; and Henhapl, Albert, 4,467,930, Cl. 215-32.000.
Wicnienski, Michael F.; and Charles, Donald E., 4,468,562, Cl. 250-372.000.

Bayer Aktiengesellschaft: *See*—
Benninghoven, Alfred; Kampf, Gunther; and Holm, Reimer, 4,468,468, Cl. 436-173.000.
Fengler, Gerd; Botta, Artur; Scheer, Martin; and Berschauer, Friedrich, 4,468,392, Cl. 424-244.000.
Ippen, Jakob; and Stuttgen, Friedel, 4,467,852, Cl. 152-158.000.
Linhart, Karl; Gleinig, Harald; Boehmke, Gunther; and Breig, Kurt, 4,468,349, Cl. 260-205.000.
Schmetzer, Johannes; Stetter, Jorg; Hammann, Ingeborg; and Homeyer, Bernhard, 4,468,397, Cl. 424-248.510.
Steinberger, Helmut; and Alberts, Heinrich, 4,468,491, Cl. 524-493.000.

Baylor, John T., to Cubic Corporation. Detection of an identification signal contained within a composite signal, without false signal recognition. 4,468,667, Cl. 343-379.000.

Bayman, Atiye; and Thomas, Mammen, to Advanced Micro Devices, Inc. Plasma etch process for single-crystal silicon with improved selectivity to silicon dioxide. 4,468,285, Cl. 156-643.000.

BBC Brown, Boveri & Company Limited: *See*—
Buhler, Karl, 4,468,781, Cl. 373-84.000.
Masek, Vratislav, 4,468,791, Cl. 375-87.000.

Beagley, Arthur E. Emergency breathing air supply system and apparatus. 4,467,796, Cl. 128-202.130.

Beasey, Ray A.: *See*—
Somers, Rex E.; Beasey, Ray A.; and Woods, Richard E., 4,467,572, Cl. 52-70.000.

Beauchamp, Robert W.: *See*—
Blau, Jonathan S.; and Beauchamp, Robert W., 4,468,748, Cl. 364-748.000.

Beck, Charles E.: *See*—
Hammer, Edward E.; and Beck, Charles E., 4,468,591, Cl. 313-594.000.

Beck, Lothar; Schnaibel, Eberhard; and Sigl, Alfred, to Robert Bosch GmbH. Vehicle wheel anti-skid or anti brake-lock system. 4,468,740, Cl. 364-426.000.

Becker, Wolfram; and Klein, Hermann, to Robert Bosch GmbH. Apparatus for recirculating the exhaust gas of an internal combustion engine. 4,467,774, Cl. 123-568.000.

Beckley, Don A.: *See—*
Street, Sidney W.; and Beckley, Don A., 4,468,497, Cl. 525-422.000.

Beckman Instruments, Inc.: *See—*
Berick, Alan C., 4,468,124, Cl. 356-411.000.
Carey, Robert S., 4,468,269, Cl. 156-175.000.

Beckman, John H.; Haettinger, George C.; and Kupcikevicius, Vytautas, to Unison Carbide Corporation. Stuffing method and apparatus. 4,467,499, Cl. 17-49.000.

Bednarczyk, Anthony J.: *See—*
Daigle, Louis J. L.; Paine, Donald C.; and Bednarczyk, Anthony J., 4,468,726, Cl. 363-161.000.

Begneaud, Donald M. Portable drill pipe cleaning apparatus. 4,467,489, Cl. 15-88.000.

Behr, Joseph L.; and Hargraves, David P., to Emerson Electric Co. Apparatus for and method of automatically adjusting the superheat setting of a thermostatic expansion valve. 4,467,613, Cl. 62-115.000.

Behringwerke Aktiengesellschaft: *See—*
Bohn, Hans; and Winckler, Wilhelm, 4,468,345, Cl. 260-112.00R.

Bell, III: John R.: *See—*
Long, Gene M.; DeWitt, Terry E.; and Bell, III: John R., 4,467,586, Cl. 52-748.000.

Bell Telephone Laboratories, Incorporated: *See—*
Burcher, Dennis S.; Dickson, David M.; and Walters, Jeffrey A., 4,468,701, Cl. 358-181.000.
Dragone, Corrado, 4,468,672, Cl. 343-783.000.

Belttary, Harold E., to Challenger Caribbean Corporation; and Commander Electrical Equipment, Inc. Bus bar connector system. 4,468,547, Cl. 200-294.000.

Ben, Victor R., to Du Pont de Nemours, E. I., and Company. Antistatic composition and polyester fiber containing same. 4,468,433, Cl. 428-372.000.

Bender, David L.; and Rea, Samuel N., to Atlantic Richfield Company. Silicon ribbon growth wheel and method for surface temperature profiling thereof. 4,468,280, Cl. 156-624.000.

Bender, David L.; and Rea, Samuel N., to Atlantic Richfield Company. Silicon ribbon growth wheel and method for heat flow control therein. 4,468,281, Cl. 156-624.000.

Bendix Corporation, The: *See—*
Brush, Robert W., Sr.; and Werth, Dee A., 4,468,077, Cl. 339-89.00M.
Chiliuffo, Ronald L.; and Kelpien, Gary D., 4,468,633, Cl. 331-56.000.
Frear, David L.; Punako, Stephen; MacAvoy, David W.; and Gallusser, David O., 4,468,078, Cl. 339-90.00R.
Kyriakos, Constantinos S., 4,468,638, Cl. 331-178.000.
Sisson, Albert E.; and Hayes, Edward J., 4,467,963, Cl. 239-90.000.
Stoneburner, G. David, 4,468,788, Cl. 375-23.000.

Bengtsson, Tor L. J.; and Ericsson, Bjorn E. Apparatus for the safekeeping of sheets of film. 4,467,919, Cl. 206-455.000.

Bennett, Peter C.: *See—*
Coffee, Ronald A.; Houghton, Leonard E.; Bennett, Peter C.; and Johnson, Graham C., 4,467,961, Cl. 239-1.000.

Benninghoven, Alfred; Kampf, Gunther; and Holm, Reimer, to Bayer Aktiengesellschaft. Process for the selective analysis of individual trace-like components in gases and liquid. 4,468,468, Cl. 436-173.000.

Benschoter, Barry R.: *See—*
McEwen, Stephen N.; Stevens, Robert L.; Benschoter, Barry R.; and Benschoter, Robert F., 4,467,633, Cl. 72-203.000.

Benschoter, Robert F.: *See—*
McEwen, Stephen N.; Stevens, Robert L.; Benschoter, Barry R.; and Benschoter, Robert F., 4,467,633, Cl. 72-203.000.

Beretta, Pier C., to Fabrica D'Armi P. Beretta S.p.A. Gun barrel choke. 4,467,546, Cl. 42-79.000.

Berger, Michael F., to Tandy Corporation. Input/output buffer circuitry. 4,468,753, Cl. 364-900.000.

Bergfeld, Manfred: *See—*
Eisenluth, Ludwig; Zengel, Hans G.; and Bergfeld, Manfred, 4,468,526, Cl. 564-76.000.

Bergholz, Eugene W.: *See—*
Kavoussi, Barry T.; and Bergholz, Eugene W., 4,468,698, Cl. 358-111.000.

Berglund, Erling: *See—*
Holmqvist, Richard; Berglund, Erling; and Hogberg, Goran, 4,467,843, Cl. 141-1.000.

Bergmann, Eduard: *See—*
Kinzl, Marwin; and Bergmann, Eduard, 4,468,596, Cl. 318-287.000.

Bergmann, Heinz. Apparatus for compacting trash in open containers. 4,467,714, Cl. 100-43.000.

Berick, Alan C., to Beckman Instruments, Inc. Double beam photometer for measuring fluid samples. 4,468,124, Cl. 356-411.000.

Berman, Max; Klimmek, William G.; and Konrad, Charles E., to General Electric Company. Plug current regulator. 4,468,599, Cl. 318-362.000.

Bernstein, Seymour: *See—*
Callahan, Francis M.; Miner, Thomas G.; and Bernstein, Seymour, 4,468,385, Cl. 424-180.000.

Berrey, Harry R.; and Caulier, Paul W., to Genicom Corporation. Pint wire actuator. 4,468,142, Cl. 400-124.000.

Berryman, Walter H.; Manson, Peter J.; Hamley, Adrian H.; and Korb, Joseph, to VDO Adolf Schindling AG. Device for the capacitive measurement of levels. 4,467,646, Cl. 73-304.00C.

Berschauer, Friedrich: *See—*
Fengler, Gerd; Botta, Artur; Scheer, Martin; and Berschauer, Friedrich, 4,468,392, Cl. 424-244.000.

Bertin, Claude L.: *See—*
Bansal, Jai P.; Bertin, Claude L.; and Troutman, Ronald R., 4,467,518, Cl. 29-571.000.

Beta Engineering & Development Ltd.: *See—*
Sadeh, Yaacov, 4,467,735, Cl. 112-121.120.

Beta Technology, Inc.: *See—*
Hanset, Richard E., 4,468,170, Cl. 417-44.000.

Beune, Joannes H.; and de Putter, Warner Uan, to Wavin B.V. Method of uniting a plastic fixation part with a sealing body. 4,468,367, Cl. 264-255.000.

Beyer, Bryan, to Ciba-Geigy Corporation. Stable purified aqueous solutions of fluorescent whitening agent. 4,468,341, Cl. 252-301.230.

Beyland, Laurens S.; and Warren, Bernard J., to GTE Products Corporation. Wedge base lamp socket. 4,468,585, Cl. 313-318.000.

Bhirwandiwala, Pooru; and Wheeler, Robert G., to Repromed, Inc. Osmotic cervical dilator. 4,467,806, Cl. 128-341.000.

Bice, Chester L., to AT&T Technologies, Inc. Method and apparatus for determining index of refraction profiles of optical fibers. 4,468,118, Cl. 356-73.100.

Bielomatik Leuze GmbH & Co.: *See—*
Klingelhoefer, Hannsgeorg; and Rudolph, Klaus-Peter, 4,467,722, Cl. 101-426.000.

Biolectron, Inc.: *See—*
Brighton, Carl T.; and Pollack, Solomon R., 4,467,808, Cl. 128-419.00F.
Brighton, Carl T., 4,467,809, Cl. 128-419.00F.

BioResearch Inc.: *See—*
Kurtz, Leonard D.; and LiCausi, Joseph M., 4,468,226, Cl. 604-321.000.

Birch, Stanley A.; Jackson, Sidney B.; Edmonds, Eric J. F.; Gigg, Robert V.; and Haggert, Norman L. Reserve parachutes. 4,467,986, Cl. 244-147.000.

Birkner, Joseph R.: *See—*
Hurley, James R.; and Birkner, Joseph R., 4,467,783, Cl. 126-378.000.

Bisco Products, Inc.: *See—*
Montana, Frank J., 4,467,863, Cl. 165-136.000.

Bjorkman, Ake: *See—*
Sikander, Ake; Bjorkman, Ake; and Jonsson, Gunther, 4,468,011, Cl. 266-149.000.

Black & Decker Inc.: *See—*
Dynie, Ernest R., 4,467,591, Cl. 56-16.400.
Sauerwein, William D.; Weber, Steve A.; and Dibbern, John E., Jr., 4,467,896, Cl. 188-69.000.

Blackwelder, Ronald A.: *See—*
Dube, C. Michael; Donohue, George L.; and Blackwelder, Ronald A., 4,467,658, Cl. 73-861.080.

Blackwell, Victor C. Toothbrush. 4,467,822, Cl. 132-84.00B.

Blaetz, Philip H.: *See—*
McCain, George R.; and Blaetz, Philip H., 4,468,135, Cl. 374-44.000.

Blair, William W.; Doran, Samuel K.; and Langner, Guenther O., to International Business Machines Corporation. Automatic focus and deflection correction in E-beam system using optical target height measurements. 4,468,565, Cl. 250-491.100.

Blake, Dale E. Horse van. 4,468,061, Cl. 296-24.00C.

Blanchard, Russell O.; Wolff, Douglas F.; Steele, Charles E.; and Molloy, Richard P., deceased (by Molloy, Vera C., heir and legal representative), to Interkal, Inc. Telescopic risers. 4,467,569, Cl. 52-9.000.

Blank, Stuart L.; and Rana, Virendra V. S., to AT&T Bell Laboratories. Garnet epitaxial films with high Curie temperatures. 4,468,438, Cl. 428-692.000.

Blankenship, Robert M.: *See—*
Kowalski, Alexander; Vogel, Martin; and Blankenship, Robert M., 4,468,498, Cl. 525-301.000.

Blau, Jonathan S.; and Beauchamp, Robert W., to Data General Corporation. Floating point computation unit having means for rounding the floating point computation result. 4,468,748, Cl. 364-748.000.

Blaut, Robert W.: *See—*
Dornbusch, Arthur H.; and Blaut, Robert W., 4,467,923, Cl. 206-602.000.

Blickenstaff, Ronald L.: *See—*
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,468,730, Cl. 364-200.000.

Bloch, Peter; Wydler, Robert; and Gunter, Erwin J., to Maag Gear-Wheel & Machine Co. Ltd. Generating method for the chip-producing machining of involute tooth flanks with profile and longitudinal corrections. 4,467,568, Cl. 51-287.000.

Blonder, Isaac S., to Blonder-Tongue Laboratories, Inc. Assymetrical folded half-dipole and linear extension antenna array. 4,468,674, Cl. 343-815.000.

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Blonder, Isaac S., 4,468,674, Cl. 343-815.000.

Blot, Michel J. Lateral packaging for holding together superimposed articles. 4,467,918, Cl. 206-430.000.

Bochantin Connor, Trudy A.: *See—*
Kelly, Paul P.; and Bochantin Connor, Trudy A., 4,468,445, Cl. 430-107.000.

Boddicker, Franc W. Method and device for cutting glass. 4,468,534, Cl. 219-121.0LG.

Boehmke, Gunther: *See*—
Linhart, Karl; Gleinig, Harald; Boehmke, Gunther; and Breig, Kurt, 4,468,349, Cl. 260-205.000.

Boehringer Mannheim GmbH: *See*—
Michel, Helmut; Kampe, Wolfgang; Ofenloch, Roland; Dietmann, Karl; and Sponer, Gisbert, 4,468,520, Cl. 424-274.000.

Boeing Company, The: *See*—
Rumberger, William E., 4,467,637, Cl. 73-61.00R.

Bogaczyk, Francis W.; Croll, Richard C.; Purcell, Billy D.; and Toutant, Edward E., to International Business Machines Corporation. Ribbon cartridge comprising a stuffer box intermediate a supply reel and take-up reel. 4,467,976, Cl. 242-67.30R.

Bohn, Hans; and Winckler, Wilhelm, to Behringwerke Aktiengesellschaft. Protein (PP_{17}), a process for concentrating and isolating it and its use. 4,468,345, Cl. 260-112.00R.

Boliden Aktiebolag: *See*—
Malmqvist, Erik L.; and Kristiansson, Krister, 4,468,558, Cl. 250-253.000.

Bonde, Robert L., to United States of America, Navy. Safe jettison device for aircraft stores. 4,467,695, Cl. 89-1.50D.

Bonitz, Jorg: *See*—
Rohde, Siegfried; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; and Schramm, Herbert, 4,467,634, Cl. 73-35.000.

Bonser, Wayne: *See*—
Rehbein, Thomas J.; and Bonser, Wayne, 4,468,624, Cl. 328-55.000.

Bookwalter, John R.: *See*—
Cabrera, Rene J.; Guay, George W.; and Bookwalter, John R., 4,467,791, Cl. 128-20.000.

Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., to Aluminum Company of America. Apparatus for control of powder production. 4,468,182, Cl. 425-7.000.

Bopp, Lawrence H., to General Electric Company. Microbiological removal of chromate from contaminated waste water. 4,468,461, Cl. 435-253.000.

Borden (UK) Limited: *See*—
Lemon, Peter H. R. B.; Railton, Jeffrey D.; Ludlam, Peter R.; and Reynolds, Timothy J., 4,468,359, Cl. 264-82.000.

Borichevsky, Donald J., to Telescope Folding Furniture Co. Inc., The. Table with releasable top. 4,467,730, Cl. 108-159.000.

Bornzin, Gene A., to Medtronic, Inc. Rate adaptive demand pacemaker. 4,467,807, Cl. 128-419.0PG.

Borowick, John: *See*—
Stern, Richard A.; Babbitt, Richard W.; and Borowick, John, 4,468,673, Cl. 343-785.000.

Bosco, Peter M.; and Sledzieski, William L., to Nabisco Brands, Inc. Low-fat, butter-flavored, liquid spread and process. 4,468,408, Cl. 426-604.000.

Bose, Sanjay K.: *See*—
Baker, Lewin T.; Bose, Sanjay K.; Ellis, George W.; and Puckette, Charles M., 4,468,792, Cl. 375-45.000.

Bosso, Joseph F.: *See*—
Wismer, Marco; and Bosso, Joseph F., 4,468,307, Cl. 204-181.00C.

Botta, Artur: *See*—
Fengler, Gerd; Botta, Artur; Scheer, Martin; and Berschauer, Friedrich, 4,468,392, Cl. 424-244.000.

Bourassa, Hugh: *See*—
Cole, Leon J.; Mallory, Edwin E.; and Bourassa, Hugh, 4,468,266, Cl. 156-131.000.

Bourdette, Stephen J.: *See*—
Bylin, Robert O.; and Bourdette, Stephen J., 4,468,557, Cl. 219-535.000.

Bout, Bernardus J.: *See*—
Smith, Ernest B.; Slabbert, Phillipus D.; Bout, Bernardus J.; and Vickers, Peter C., 4,467,895, Cl. 187-29.00R.

Bowen, Michael W.; and Parrish, Robert G., to Du Pont de Nemours, E. I., and Company. Coating composition. 4,468,505, Cl. 525-432.000.

Bowen, Ted R., to GTE Automatic Electric Inc. Circuit for extending a multiplexed address and data bus to distant peripheral devices. 4,468,737, Cl. 364-200.000.

Boyd, Andrew B., to Andy Boyd Company, The. Shuttle valve assembly. 4,467,825, Cl. 137-112.000.

Boyer, Herbert W.: *See*—
Cohen, Stanley N.; and Boyer, Herbert W., 4,468,464, Cl. 435-317.000.

Boyer, Robert; and Journoux, Jean-Pierre, to Commissariat a l'Energie Atomique. Ion source. 4,468,564, Cl. 250-427.000.

Boyes, David H.: *See*—
Young, David E.; and Boyes, David H., 4,467,792, Cl. 128-88.000.

Boynton, Stephanie W. Enlaceable serviette. 4,467,503, Cl. 24-7.000.

Braatz, Andreas; Weintz, Johann; and Kurz, Wolf-Dieter, to Daimler-Benz Aktiengesellschaft. Fluid-friction clutch. 4,467,747, Cl. 123-41.120.

Bradburn, Marvin D.: *See*—
Woods, Richard E.; and Bradburn, Marvin D., 4,467,716, Cl. 100-45.000.

Bradley, Gordon C.; and Coleman, Ben E. Oil injector for refrigerants of air conditioners and the like. 4,467,620, Cl. 62-292.000.

Bradley, Irving; and Povall, Gerald W., to General Electric Company. Double latch snap lock base for annular fluorescent lamps. 4,468,071, Cl. 339-50.00C.

Bradley, Velma L. Inserted labels - address book. 4,468,053, Cl. 281-31.000.

Brantingham, George L.: *See*—
Wiggins, Richard H., Jr.; and Brantingham, George L., 4,468,805, Cl. 381-51.000.

Brastow, Carl H.; and Mallett, Joel D., to Conceptual Engineering Associates, Inc. Automatic chain welding apparatus. 4,468,553, Cl. 219-51.000.

Braunling, Russell D.; and Kurschner, Dennis L., to Honeywell Inc. Seismic intruder detection using pressure waves. 4,468,763, Cl. 367-136.000.

Brazel, Patrick J. High temperature seal. 4,468,043, Cl. 277-235.00B.

Breck, Louis W., Jr. Programmable sewing machine. 4,467,737, Cl. 112-121.140.

Breidenthal, Robert E., Jr. Method and apparatus for fiberizing meltable materials. 4,468,241, Cl. 65-5.000.

Breig, Kurt: *See*—
Linhart, Karl; Gleinig, Harald; Boehmke, Gunther; and Breig, Kurt, 4,468,349, Cl. 260-205.000.

Brenneman, Richard S.: *See*—
Snyder, Robert G.; Clancy, John J.; and Brenneman, Richard S., 4,467,915, Cl. 206-219.000.

Brenneman, William L., to Olin Corporation. Process for obtaining a composite article. 4,467,954, Cl. 228-117.000.

Bretzinger, Dieter: *See*—
Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, 4,468,353, Cl. 260-465.400.

Bridgestone Tire Co., Ltd.: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,468,496, Cl. 525-233.000.

Brighton, Carl T.; and Pollack, Solomon R., to Biolectron, Inc. Method for preventing and treating osteoporosis in a living body by using electrical stimulation non-invasively. 4,467,808, Cl. 128-419.00F.

Brighton, Carl T., to Biolectron, Inc. Method for non-invasive electrical stimulation of epiphyseal plate growth. 4,467,809, Cl. 128-419.00F.

Bristol-Myers Company: *See*—
Hanada, Minoru; Tsunakawa, Mitsuaki; Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, 4,468,386, Cl. 424-181.000.

British Gas Corporation: *See*—
Reeves, Richard, 4,468,619, Cl. 324-220.000.

British Telecommunications: *See*—
Aldous, Derek R.; and Melling, Robert J., 4,467,726, Cl. 104-246.000.
Hensel, Paul C.; and Hooper, Raymond C., 4,468,765, Cl. 370-1.000.

Brodeur, Lester R., to Sanders Associates, Inc. Method for processing signals in a navigation receiver. 4,468,668, Cl. 343-389.000.

Brody, Garry S. Method of surgically repairing an injured human joint and a prosthetic device therefor. 4,467,479, Cl. 3-1.910.

Broida, Joel G. Camera system. 4,468,106, Cl. 354-137.000.

Bronstein-Bonte, Irena Y.: *See*—
Barton, Derek H. R.; Bronstein-Bonte, Irena Y.; and Taylor, Lloyd D., 4,468,494, Cl. 525-353.000.

Brorein, William J., to GK Technologies, Inc. Flat cable of assembled modules and method of manufacture. 4,468,089, Cl. 350-96.230.

Brother Kogyo Kabushiki Kaisha: *See*—
Hattori, Shigenori, 4,468,139, Cl. 400-120.000.

Brown, Arthur D.; and Jones, Stephen G. B. Effluent treatment. 4,468,327, Cl. 210-626.000.

Brown, Clyde P., to Du Pont de Nemours, E. I., and Company. Antifoggant process. 4,468,454, Cl. 430-569.000.

Brown, Douglas E., to United States of America, National Security Agency. Hybrid space/time integrating optical ambiguity processor. 4,468,093, Cl. 350-162.120.

Brown, Joann. Micrometer holder. 4,467,946, Cl. 224-252.000.

Bruderreck, Hartmut; Deininger, Gunter; Gottlieb, Klaus; Wehmeier, Friedel-Heinrich; and Haselhorst, Manfred, to Veba Oel AG. Motor fuel containing tert-butyl ethers. 4,468,233, Cl. 44-56.000.

Brumbaugh, Donald L.: *See*—
Wang, Anthony D.; and Brumbaugh, Donald L., 4,468,652, Cl. 340-347.0DA.

Brumm, Douglas: *See*—
Gimmestad, Beverly; and Brumm, Douglas, 4,468,203, Cl. 434-228.000.

Brush, Robert W., Sr.; and Werth, Dee A., to Bendix Corporation, The. Electrical connector assembly having an anti-decoupling device. 4,468,077, Cl. 339-89.00M.

Bryant, W. Robert: *See*—
Saxon, Ross E.; and Bryant, W. Robert, 4,467,798, Cl. 128-205.260.

bso Steuerungstechnik GmbH: *See*—
Gibas, Christoph, 4,468,647, Cl. 335-262.000.

Bucheit, Frederick C. Flue flow regulator. 4,467,957, Cl. 236-96.000.

Buchovecky, Kalman E.: *See*—
Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., 4,468,183, Cl. 425-7.000.

Buchtel, Dean H., to Hoover Company, The. Latching arrangement for a floor care appliance with mounted accessory appliance. 4,467,493, Cl. 15-323.000.

Buck, Rainer; Kuttner, Thomas; and Wessel, Wolf, to Robert Bosch GmbH. Method and apparatus for controlling recirculated quantities of exhaust gas in internal combustion engines. 4,467,775, Cl. 123-571.000.

Buhler, Karl, to BBC Brown, Boveri & Company Limited. Tiltable arc furnace. 4,468,781, Cl. 373-84.000.

Bui, Ngoc C.; and Simonet, Daniel, to Asulab S.A. Electronic watch having a non-moving means of control. 4,468,131, Cl. 368-69.000.

Buist, Richard J.: *See*—
Nelson, John L.; Montgomery, Robert L.; and Buist, Richard J., 4,467,611, Cl. 62-3.000.

Bula, Roger M.: *See*—
Galloup, Clifford L.; and Bula, Roger M., 4,467,842, Cl. 140-124.000.
Bunger, Richard E. Moisture reducing ram press. 4,467,715, Cl. 100-45.000.
Burcher, Dennis S.; Dickson, David M.; and Walters, Jeffrey A., to Bell Telephone Laboratories, Incorporated. Video signal actuated switch. 4,468,701, Cl. 358-181.000.
Burdick, Jack B.: *See*—
Yock, Lewis M.; and Burdick, Jack B., 4,468,325, Cl. 210-408.000.
Bureau, Gerard: *See*—
Jamet, Michel; Urien, Jean Claude; and Bureau, Gerard, 4,468,615, Cl. 324-158.00P.
Burge, Edward V., to Hawn, Richard D., Jr. Well bore tools. 4,467,879, Cl. 175-325.000.
Burgers, Helmut. Outer frame for facing a wall opening. 4,467,576, Cl. 52-212.000.
Burke Company, The: *See*—
Kelly, David L.; and Turner, Frank E., 4,468,149, Cl. 403-316.000.
Burke, Timothy M.; Smith, Paul F.; Noble, Scott W.; and Schorman, Eric R., to Motorola, Inc. Digital voice storage system. 4,468,813, Cl. 455-38.000.
Burkhardt, James: *See*—
Wray, William R.; and Burkhardt, James, 4,468,637, Cl. 331-143.000.
Burmester, Hans-Georg: *See*—
Johne, Frank; Hartkamp, Hans G.; and Burmester, Hans-Georg, 4,467,679, Cl. 82-36.00R.
Burr-Brown Research Corporation: *See*—
Wang, Anthony D.; and Brumbaugh, Donald L., 4,468,652, Cl. 340-347.0DA.
Burroughs Corporation: *See*—
DeSantis, Alfred J.; and Schibinger, Joseph S., 4,468,736, Cl. 364-200.000.
Burton, Jack D., to Exxon Research and Engineering Co. Data transition enhancement. 4,468,705, Cl. 358-284.000.
Busby, Richard D. Method and apparatus for construction second story additions to pre-existing residential structures. 4,467,585, Cl. 52-741.000.
Bush, Clarence C., deceased (by Bush, Florence, administratrix), to United States of America, Army. Apparatus and method for measuring gyroscopic stability. 4,467,639, Cl. 73-66.000.
Bush, Florence, administratrix: *See*—
Bush, Clarence C., deceased, 4,467,639, Cl. 73-66.000.
Bussgang, Julian J.: *See*—
Kates, James M.; and Bussgang, Julian J., 4,468,804, Cl. 381-47.000.
Butler, James R.; Watson, James M.; Kendall, Debra L.; and Mikkelson, Karen A., to Cosden Technology, Inc. Polymerization co-inhibitors for vinyl aromatic compounds. 4,468,343, Cl. 252-403.000.
Butler, Russell H.: *See*—
Oswald, Hendrikus J.; Butler, Russell H.; and Li, Hsin L., 4,467,507, Cl. 28-257.000.
Bylin Heating Systems, Inc.: *See*—
Bylin, Robert O.; and Bourdette, Stephen J., 4,468,557, Cl. 219-535.000.
Bylin, Robert O.; and Bourdette, Stephen J., to Bylin Heating Systems, Inc. Conformable electric heating apparatus. 4,468,557, Cl. 219-535.000.
Byrne, Stephen C.; and Vasudevan, Asuri K., to Aluminum Company of America. Diffusion welded nonconsumable electrode assembly and use thereof for electrolytic production of metals and silicon. 4,468,298, Cl. 204-60.000.
Byrne, Stephen C.; Ray, Siba P.; and Rapp, Robert A., to Aluminum Company of America. Friction welded nonconsumable electrode assembly and use thereof for electrolytic production of metals and silicon. 4,468,299, Cl. 204-60.000.
Byrne, Stephen C.; and Ray, Siba P., to Aluminum Company of America. Nonconsumable electrode assembly and use thereof for the electrolytic production of metals and silicon. 4,468,300, Cl. 204-60.000.
C & J Industries, Inc.: *See*—
Lee, Chen Y., 4,467,655, Cl. 73-724.000.
Cabrera, Rene J.; Guay, George W.; and Bookwalter, John R., to Codman & Shurtleff, Inc. Surgical retractor holder. 4,467,791, Cl. 128-20.000.
Cadoret, Robert M. M. H.; Omaly, Jean E. M.; and Robert, Marc A., to Centre National d'Etudes Spatiales. Process for mono-crystal growth in a closed tubular chamber. 4,468,278, Cl. 156-610.000.
Cagles, Inc.: *See*—
Olson, Harold D., 4,467,500, Cl. 17-52.000.
Cahill, Lysle D., to Coulter Systems Corporation. Imaging by varying the placement of elements in the pixels. 4,468,706, Cl. 358-300.000.
Cahill, Lysle D.: *See*—
Kuehnle, Manfred R.; and Cahill, Lysle D., 4,468,707, Cl. 358-300.000.
Calderwood, Thomas S.: *See*—
Sawyer, Donald T.; and Calderwood, Thomas S., 4,468,297, Cl. 204-59.00R.
Callahan, Francis M.; Miner, Thomas G.; and Bernstein, Seymour, to American Cyanamid Company. Poly-cation salts of 4-O-poly-hexaose-thio-alkylene sulfate derivatives and method of use. 4,468,385, Cl. 424-180.000.
Campbell Automation, Incorporated: *See*—
Campbell, Robert L., Jr., 4,468,160, Cl. 409-202.000.
Campbell, Robert H. Safety apparatus for portable fuel-burning heaters. 4,467,781, Cl. 126-201.000.
Campbell, Robert L., Jr., to Campbell Automation, Incorporated. Woodworking machine. 4,468,160, Cl. 409-202.000.
Canada, Atomic Energy of, Limited: *See*—
Backer, Simon; and Smith, Michael T., 4,467,935, Cl. 220-214.000.
Canadian National Railway Company: *See*—
Field, Robert C., 4,468,814, Cl. 455-159.000.
Canadian Patents & Development Limited: *See*—
Knaus, Edward E.; Warren, Brent K.; and Ondrus, Theodore A., 4,468,403, Cl. 424-267.000.
Candor, James T. Electrostatic method and apparatus for treating material. 4,467,529, Cl. 34-1.000.
Canon Kabushiki Kaisha: *See*—
Ikemori, Keiji, 4,468,099, Cl. 350-454.000.
Nakata, Shinichi, 4,467,949, Cl. 226-45.000.
Ohara, Tsunemasa; and Suzuki, Masayuki, 4,468,439, Cl. 429-1.000.
Shimizu, Isamu; Ogawa, Kyosuke; Inoue, Eiichi; and Kanbe, Junichiro, 4,468,443, Cl. 430-60.000.
Suzuki, Akio; and Hirayama, Kazuhiro, 4,468,112, Cl. 355-14.00D.
Tanigawa, Koichi; Ohkubo, Masaharu; Takahashi, Masayoshi; and Tamura, Yasuyuki, 4,468,110, Cl. 355-3.0TR.
Canterra Energy Ltd.: *See*—
Adamache, Ion, 4,467,868, Cl. 166-263.000.
Cantrell Machine Co., Inc.: *See*—
Graham, Johnny R.; and Graham, Kenneth Z., 4,467,498, Cl. 17-45.000.
Caoutchouc Manufacture et Plastiques: *See*—
Champleboux, Jacques, 4,467,835, Cl. 138-93.000.
Ragout, Bernard, 4,467,836, Cl. 138-93.000.
Cardiac Resuscitator Corporation: *See*—
Schomburg, Richard A., 4,467,813, Cl. 128-702.000.
Carella, Richard F. Fixture for forming arrow fletching. 4,468,189, Cl. 425-391.000.
Carey, Robert S., to Beckman Instruments, Inc. Ultracentrifuge rotor. 4,468,269, Cl. 156-175.000.
Carr, Walter J., Jr.; and Miller, Robert C. Generating power from the ocean utilizing the thermal properties of magnetic material. 4,468,568, Cl. 290-1.00R.
Carre, Jean-Jacques: *See*—
Courbot, Pierre; and Carre, Jean-Jacques, 4,467,898, Cl. 188-73.440.
Carrico, Robert J.: *See*—
Atkinson, David C.; Carrico, Robert J.; and Morris, David L., 4,468,469, Cl. 436-500.000.
Carrier Corporation: *See*—
Ripka, Chester D., 4,467,780, Cl. 126-110.00R.
Carrison, Craig L.; Joseph, James D.; and Narendra, Patrenahalli M., to Honeywell Inc. Integrated cellular array parallel processor. 4,468,727, Cl. 364-200.000.
Carroll, Thomas J.; and Paisley, James K., to General Motors Corporation. Energy efficient building structure and panel therefor. 4,467,859, Cl. 165-57.000.
Carse, Clifford C. Liquid dispensing valve assembly. 4,467,943, Cl. 222-309.000.
Cartwright, Robert B. Food warmer. 4,468,424, Cl. 428-103.000.
Carveth, Peter, to Baxter Travenol Laboratories, Inc. Separated packaging and sterile processing for liquid-powder mixing. 4,467,588, Cl. 53-425.000.
Casalone, Enrico, to WABCO Westinghouse Compagnia Freni S.p.A. Vehicle brake unit. 4,467,704, Cl. 92-129.000.
Caulier, Paul W.: *See*—
Berrey, Harry R.; and Caulier, Paul W., 4,468,142, Cl. 400-124.000.
Caunt, Anthony D.; Gavens, Paul D.; and McMeeking, John, to Imperial Chemical Industries PLC. Production of catalyst component, catalyst and use thereof. 4,468,477, Cl. 502-104.000.
Cawlfield, David W.: *See*—
Early, Allen D.; Cawlfield, David W.; Walker, Trevor; and Weisman, Paul T., 4,468,428, Cl. 428-221.000.
Celanese Corporation: *See*—
Ide, Yoshiaki, 4,468,364, Cl. 264-176.00R.
Centre National de la Recherche Scientifique: *See*—
Meyer, Yves H.; and Nentchev, Marin N., 4,468,775, Cl. 372-92.000.
Centre National d'Etudes Spatiales: *See*—
Cadoret, Robert M. M. H.; Omaly, Jean E. M.; and Robert, Marc A., 4,468,278, Cl. 156-610.000.
Cerovsky, Karel: *See*—
Dvorsky, Drahomir; and Cerovsky, Karel, 4,468,228, Cl. 8-188.000.
Chabot, Louis. Device for retrieving a fishing lure. 4,467,547, Cl. 43-17.200.
Chaffiotte, Pierre, to Regie Nationale des Usines Renault. Turbo-compressor supercharger device for internal combustion engine. 4,467,606, Cl. 60-602.000.
Challenger Caribbean Corporation: *See*—
Belttary, Harold E., 4,468,547, Cl. 200-294.000.
Chambers, Roland A., to Marathon Oil Company. Automatic flame snuffer for storage tank vent lines with manual override. 4,468,194, Cl. 431-152.000.
Chamoff, Martin E.; and Piller, Don W., to International Business Machines Corporation. Clustered terminals with writable microcode memories & removable media for applications code & transactions data. 4,468,750, Cl. 364-900.000.
Champleboux, Jacques, to Caoutchouc Manufacture et Plastiques. Shut-off devices. 4,467,835, Cl. 138-93.000.
Chamran, Mort; and Ferber, Alan, to Perkin-Elmer Corporation, The. Stepper motor control. 4,468,601, Cl. 318-696.000.
Chan Computer Corporation: *See*—
Chan, Yim F., 4,468,756, Cl. 364-900.000.

Chan, David C. K., to Chevron Research Company. Herbicidal 4-[3'-(4''-trifluoromethyl-phenoxy)-phenoxy]-4-methyl-crotonates. 4,468,247, Cl. 71-108.000.
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Gianzero, Stanley C.; Palaith, David E.; and Chan, David S. K., 4,468,623, Cl. 324-367.000.
Chan, Yim F., to Chan Computer Corporation. Method and apparatus for processing languages. 4,468,756, Cl. 364-900.000.
Chandler Evans, Inc.: *See*—
Morrison, Terry, 4,467,640, Cl. 73-117.300.
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Piccirilli, Robert; and Chang, Wen-Hsuan, 4,468,492, Cl. 525-102.000.
Chao, Chung-Yao: *See*—
Polan, Ned W.; and Chao, Chung-Yao, 4,468,293, Cl. 204-27.000.
Charles, Donald E.: *See*—
Wicnienski, Michael F.; and Charles, Donald E., 4,468,562, Cl. 250-372.000.
Chatham, Dale, to Tandy Corporation. Data synchronization apparatus. 4,468,752, Cl. 364-900.000.
Chatterjea, Probir K.: *See*—
Shore, Daniel B.; and Chatterjea, Probir K., 4,467,900, Cl. 192-13.00R.
Chemetron Process Equipment, Inc.: *See*—
Metzroth, Douglas J., 4,468,409, Cl. 426-659.000.
Chemroll Enterprises, Inc.: *See*—
Swanson, Rollan, 4,468,316, Cl. 208-59.000.
Chen, Anthony B.; Harte, Richard A.; and Kaufman, Nancy K., to Daryl Laboratories, Inc. Immunoassay test slide. 4,468,371, Cl. 422-102.000.
Chen, Catherine S. H.; and Williams, Albert L., to Mobil Oil Corporation. Branched alkylpolyethoxypropane sulfonates and their use in enhanced oil recovery. 4,468,335, Cl. 252-8.55D.
Chen, Catherine S. H., to Mobil Oil Corporation. Blends of surfactant homologues adjusted to salinity during waterflooding. 4,468,342, Cl. 252-353.000.
Chen, Hao-Chia: *See*—
Rodbard, David; Shimohigashi, Y.; Chen, Hao-Chia; and Costa, Tommaso, 4,468,383, Cl. 424-177.000.
Cheng, Yung-Chi: *See*—
Bardos, Thomas J.; Cheng, Yung-Chi; and Schroeder, Alan C., 4,468,384, Cl. 424-180.000.
Chevalier, Jean P.: *See*—
Drolet, Jean P.; and Chevalier, Jean P., 4,468,473, Cl. 501-155.000.
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Chan, David C. K., 4,468,247, Cl. 71-108.000.
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Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,468,068, Cl. 312-333.000.
Chiba, Taneaki: *See*—
Suzuki, Yasuo; and Chiba, Taneaki, 4,468,670, Cl. 343-727.000.
Chicago Pneumatic Tool Company: *See*—
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,467,565, Cl. 51-170.0MT.
Chikano, Mitsuo, to Hoya Corporation. Lens shade. 4,468,102, Cl. 350-581.000.
Children's Hospital Medical Center: *See*—
Clark, Leland C., Jr., 4,467,811, Cl. 128-635.000.
Chilluffo, Ronald L.; and Kelpien, Gary D., to Bendix Corporation, The. Adjustable microwave power combiner for a plurality of coaxially mounted impatt diodes. 4,468,633, Cl. 331-56.000.
Chisholm, William M., to AT&T Technologies, Inc. Methods of and apparatus for inserting pins into a substrate. 4,467,523, Cl. 29-845.000.
Chisso Corporation: *See*—
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,468,340, Cl. 252-299.630.
Chiusoli, Gian Paolo; Costa, Mirco; Pallini, Luciano; and Terenghi, Giuliana, to Anic S.p.A. Process for the preparation of (omega-carboalkoxy-nor.alkyl)-dialkylamines. 4,468,522, Cl. 560-155.000.
Chlorella Industry Co., Ltd.: *See*—
Kumamoto, Shoichiro, 4,468,460, Cl. 435-240.000.
Choma, John, Jr., to TRW Inc. NPN Operational amplifier. 4,468,629, Cl. 330-260.000.
Choy, Andrew L.: *See*—
Lee, Noel; and Choy, Andrew L., 4,468,083, Cl. 339-252.00P.
Christensen, Inc.: *See*—
Jurgens, Rainer, 4,468,762, Cl. 367-83.000.
Chu, Ruey-Shi: *See*—
Wang, Shii-Shyong; and Chu, Ruey-Shi, 4,468,669, Cl. 343-703.000.
Chugunny, Evgeny G.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; and Shumikhin, Vladimir S., 4,468,771, Cl. 374-131.000.
Ciba-Geigy Corporation: *See*—
Beyer, Bryan, 4,468,341, Cl. 252-301.230.
Luthi, Christian; Meyer, Hans R.; and Weber, Kurt, 4,468,352, Cl. 260-459.00A.
Su, Kai C., 4,468,229, Cl. 8-507.000.
Szczepanski, Henry, 4,468,242, Cl. 71-88.000.
Zahir, Sheik A.; and Eldin, Sameer H., 4,468,524, Cl. 560-221.000.
Cincinnati Electronics Corporation: *See*—
Davis, R. M., 4,468,746, Cl. 364-569.000.
Ciraulo, James N.: *See*—
O'Brien, William J.; and Ciraulo, James N., 4,467,815, Cl. 128-740.000.
Clancy, John J.: *See*—
Snyder, Robert G.; Clancy, John J.; and Brenneman, Richard S., 4,467,915, Cl. 206-219.000.
Clark, Leland C., Jr., to Children's Hospital Medical Center. Method of polarographic analysis of lactic acid and lactate. 4,467,811, Cl. 128-635.000.
Clark, Paul M.; Fenwick, Danny L.; and Hopkins, Jon D., to General Electric Company. Pneumatic reed switch. 4,468,532, Cl. 200-81.90R.
Clarke, Theodore R.; and Hosler, John F., to Formica Corp. High pressure decorative laminates containing an air-laid web of fibers and filler and method of producing same. 4,468,264, Cl. 156-62.200.
Clauss, Harry G.; and Wiese, John R., to General Signal Corporation. Refractory protection tube for immersion molten metal devices. 4,468,009, Cl. 266-99.000.
Clifford, Thomas J.; and Jansen, Bernard L. Emergency signalling unit and alarm system for rescuing endangered workers. 4,468,656, Cl. 340-539.000.
Cline, David M. Drum brake conversion method and apparatus for a turret unwinding stand. 4,467,513, Cl. 29-401.100.
Clinicon AB: *See*—
Holmqvist, Richard; Berglund, Erling; and Hogberg, Goran, 4,467,843, Cl. 141-1.000.
Clinton, Albert J.: *See*—
O'Doherty, George O. P.; and Clinton, Albert J., 4,468,380, Cl. 424-114.000.
Clot, Jean: *See*—
Levallois, Emile; Szabo, Rene ; Clot, Jean; and Esteve, Daniel, 4,468,155, Cl. 405-170.000.
Coast, John B.: *See*—
Guglielmo, Alfred R.; and Coast, John B., 4,467,501, Cl. 17-71.000.
Coastcom: *See*—
Warren, Toney C.; and Hance, Michael E., 4,468,767, Cl. 370-55.000.
Cobey, Herbert T. Continuous conveyor composter method and apparatus. 4,468,128, Cl. 366-156.000.
Coble, William H.; Shields, Harper; and Farrell, Roscoe M., to Kayser-Roth Hosiery, Inc. Sock with double-layer fabric in foot and method. 4,467,626, Cl. 66-196.000.
Coca-Cola Company, The: *See*—
Morgan, Annis R., Jr.; and King, Eddie W., 4,467,617, Cl. 62-180.000.
Codman & Shurtleff, Inc.: *See*—
Cabrera, Rene J.; Guay, George W.; and Bookwalter, John R., 4,467,791, Cl. 128-20.000.
Coffee, Ronald A.; Houghton, Leonard E.; Bennett, Peter C.; and Johnson, Graham C., to Imperial Chemical Industries PLC. Container and spraying system. 4,467,961, Cl. 239-1.000.
Cogan, Adrian I., to GTE Laboratories Incorporated. Self-aligned high-frequency static induction transistor. 4,468,682, Cl. 357-22.000.
Cohen, Howard. Method for making dental impressions. 4,468,202, Cl. 433-199.000.
Cohen, Sam G., to Timex Corporation. Terminal equipment ring/ding suppression circuit. 4,468,541, Cl. 179-84.00C.
Cohen, Stanley N.; and Boyer, Herbert W., to Leland Stanford Junior University, The Board of Trustees of The. Biologically functional molecular chimeras. 4,468,464, Cl. 435-317.000.
Cole, Leon J.; Mallory, Edwin E.; and Bourassa, Hugh, to National-Standard Company. Bead and filler assembly machine and method of operation thereof. 4,468,266, Cl. 156-131.000.
Coleman, Ben E.: *See*—
Bradley, Gordon C.; and Coleman, Ben E., 4,467,620, Cl. 62-292.000.
Coleman, Charles H., Jr., to Ampex Corporation. Combined data rate reduction system. 4,468,708, Cl. 358-310.000.
Colgate-Palmolive Company: *See*—
Greenland, Harry; and Hodgetts, Edward S., 4,467,921, Cl. 206-524.400.
Colle, Roberto; Gozzo, Franco; and Preziuso, Ciro, to Montedison S.p.A. Herbicides. 4,468,243, Cl. 71-88.000.
Colledge, Edwin H.: *See*—
ue Lappe, Brock W.; Risebrough, Robert W.; Walker, Wayman, II; and Colledge, Edwin H., 4,468,324, Cl. 210-350.000.
Collgon, Pierre C. Method for the conformation of a metallic tube, particularly for a heat exchanger, and a heat exchanger provided with tubes thus conformed. 4,467,511, Cl. 29-157.30C.
Colpitt B.V.: *See*—
Termaat, Albertus B , 4,468,213, Cl. 493-213.000.
Combustion Engineering, Inc.: *See*—
Creek, Ronald B., 4,467,488, Cl. 15-3.500.
Commander Electrical Equipment, Inc.: *See*—
Belttary, Harold E., 4,468,547, Cl. 200-294.000.
Commissariat a l'Energie Atomique: *See*—
Boyer, Robert; and Journoux, Jean-Pierre, 4,468,564, Cl. 250-427.000.
Compagnie Generale pour les Developpements Operationnels des Richesses sous-Marines "C.G. Doris": *See*—
Lamy, Jacques E.; and de Asis Manuel Serrano, Francisco, 4,468,152, Cl. 405-61.000.
Compton, Perry L.: *See*—
Gaulden, Joe L.; and Compton, Perry L., 4,468,806, Cl. 381-123.000.
Conair Corporation: *See*—
Stewart, James B., 4,467,821, Cl. 132-40.000.

Conceptual Engineering Associates, Inc.: *See*—
Brastow, Carl H.; and Mallett, Joel D., 4,468,553, Cl. 219-51.000.

Conoco Inc.: *See*—
Yang, Kang; and Reedy, James D., 4,468,476, Cl. 502-83.000.

Conradty, Claudio: *See*—
Bauer, Hanns G.; Zollner, Dieter H.; Otto, Josef; Muhlesbeck, Josef; Rittmann, Friedrich; Conradty, Claudio; Lauterbach-Dammler, Inge; and Sonke, Horst, 4,468,783, Cl. 373-93.000.

Constantin Systems, Inc.: *See*—
Montgomery, John R., 4,468,105, Cl. 353-66.000.

Contitronix, Inc.: *See*—
McMahon, Ronald G.; and Hale, Donnie E., 4,468,144, Cl. 400-354.000.

Contois, Lawrence E., to Eastman Kodak Company. Pyrylium-sensitized leuco base photoconductive compositions and elements containing naphthalene bis-dicarboximide compounds. 4,468,444, Cl. 430-72.000.

Cook, Steven L.: *See*—
Van Sickle, Dale E.; Newland, Gordon C.; Siirola, Jeffrey J.; and Cook, Steven L., 4,468,356, Cl. 260-544.00Y.

Cooley Incorporated: *See*—
Siener, Philip R., Jr.; and McCusker, Joseph H., 4,468,422, Cl. 428-57.000.

Cooper Industries, Inc.: *See*—
Galloup, Clifford L.; and Bula, Roger M., 4,467,842, Cl. 140-124.000.

Cooper, Robin D. G., to Eli Lilly and Company. Preparation of 3-bromocephalosporins from thiazoline azetidinones. 4,468,514, Cl. 544-027.000.

Corbett, Daniel W.; Cunningham, George M.; and Socha, Louis S., Jr., to Corning Glass Works. Extrusion dies for thin wall substrates. 4,468,365, Cl. 264-177.00R.

Cordis Corporation: *See*—
Harris, Donald L., 4,467,817, Cl. 128-786.000.
Vollmann, William, 4,467,810, Cl. 128-419.0PG.

Corey, Victor B.: *See*—
Peters, Rex B.; Malametz, Arnold; Toms, Jeffrey F.; Lee, Charles K.; Gogic, Aleksandar M.; and Corey, Victor B., 4,467,651, Cl. 73-497.000.

Corning Glass Works: *See*—
Corbett, Daniel W.; Cunningham, George M.; and Socha, Louis S., Jr., 4,468,365, Cl. 264-177.00R.
Socha, Louis S., Jr., 4,468,366, Cl. 264-177.00R.

Cosden Technology, Inc.: *See*—
Butler, James R.; Watson, James M.; Kendall, Debra L.; and Mikkelson, Karen A., 4,468,343, Cl. 252-403.000.
MacLaughlin, Donald; and Fortuna, Vincent E., 4,468,265, Cl. 156-64.000.

Costa, Mirco: *See*—
Chiusoli, Gian Paolo; Costa, Mirco; Pallini, Luciano; and Terenghi, Giuliana, 4,468,522, Cl. 560-155.000.

Costa, Tommaso: *See*—
Rodbard, David; Shimohigashi, Y.; Chen, Hao-Chia; and Costa, Tommaso, 4,468,383, Cl. 424-177.000.

Costello, Michael C.: *See*—
Griffin, Arnold F.; and Costello, Michael C., 4,468,303, Cl. 204-109.000.

Costruziosi Meccaniche G. Mazzoni S.p.A: *See*—
Mazzoni, Guido, 4,468,126, Cl. 366-87.000.

Coulson, Richard L.: *See*—
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,468,730, Cl. 364-200.000.

Coulter Systems Corporation: *See*—
Cahill, Lysle D., 4,468,706, Cl. 358-300.000.
Kuehnle, Manfred R.; and Cahill, Lysle D., 4,468,707, Cl. 358-300.000.

Courbot, Pierre; and Carre, Jean-Jacques, to Societe Anonyme DBA. Disc brake. 4,467,898, Cl. 188-73.440.

Cousins, Frederick W.: *See*—
Babbage, Thomas A.; and Cousins, Frederick W., 4,467,778, Cl. 126-77.000.

Cox, John M.: *See*—
Sunkle, Thomas H.; and Cox, John M., 4,468,768, Cl. 371-16.000.

Cox, Roger B.; and Steer, David C., to Lever Brothers Company. Aqueous drilling fluid and mobility control solution for use on recovery. 4,468,334, Cl. 252-8.50C.

Creek, Ronald B., to Combustion Engineering, Inc. Device for final cleaning of tubes. 4,467,488, Cl. 15-3.500.

CRI Engineering, Inc.: *See*—
Gillman, Dale C., 4,468,779, Cl. 373-36.000.

Crim, Frank T. Bathroom tissue dispenser. 4,467,974, Cl. 242-55.530.

Cripps, Peter K., to GTE Automatic Electric Inc. Wireless telephone system with high level dial pulse signalling. 4,468,538, Cl. 179-2.0EA.

Cripps, Peter K., to GTE Automatic Electric Inc. Wireless telephone system with combination filter/oscillator circuit. 4,468,540, Cl. 179-2.0EA.

Crist, Wilmer W. Workover rig support apparatus. 4,467,864, Cl. 166-96.000.

Crites, Robert C.; and Youngs, Wilbur R., to Crites, Robert C., a part interest. Method and apparatus for attaching furring to columns. 4,467,584, Cl. 52-727.000.

Croll, Richard C.: *See*—
Bogaczyk, Francis W.; Croll, Richard C.; Purcell, Billy D.; and Toutant, Edward E., 4,467,976, Cl. 242-67.30R.

Croser, Brian J., to Oenotec Pty. Limited. Bottle filling device. 4,467,846, Cl. 141-47.000.

Crowley, Albert T., to RCA Corporation. Phase locked loop frequency synthesizer including fractional digital frequency divider. 4,468,632, Cl. 331-14.000.

Crucible Society Anonyme: *See*—
Smith, Ernest B.; Slabbert, Phillipus D.; Bout, Bernardus J.; and Vickers, Peter C., 4,467,895, Cl. 187-29.00R.

Crump, Druce K.; and Wilson, David A., to Dow Chemical Company, The. Set retarding additives for cement from aminomethylenephosphonic acid derivatives. 4,468,252, Cl. 106-90.000.

Cruser, Stephen A.: *See*—
Slough, Carlton M.; and Cruser, Stephen A., 4,468,613, Cl. 324-71.200.

Cubic Corporation: *See*—
Baylor, John T., 4,468,667, Cl. 343-379.000.

Culver, William H.: *See*—
Schmadel, Donald; Culver, William H.; and Gould, Gordon, 4,468,091, Cl. 350-96.300.

Cunningham, Donald M.; and Stover, John C., to Emerson Electric Co. Electric heating elements. 4,468,556, Cl. 219-523.000.

Cunningham, George M.: *See*—
Corbett, Daniel W.; Cunningham, George M.; and Socha, Louis S., Jr., 4,468,365, Cl. 264-177.00R.

Cuscurida, Michael: *See*—
Yeakey, Ernest L.; and Cuscurida, Michael, 4,468,483, Cl. 521-172.000.

D. W. Zimmerman Mfg., Inc.: *See*—
Owen, Douglas B., 4,468,175, Cl. 417-394.000.

Dabich, Robert M. Easy lift pit lid. 4,467,932, Cl. 220-18.000.

Daca International B.V.: *See*—
Jandrell, Louis H. M., 4,468,702, Cl. 358-245.000.

Dagn, Josef. Testing instrument for pipes or other cavities to be tested as to tightness. 4,467,636, Cl. 73-49.800.

D'Agostino, Vincent F.; and Lee, Joseph Y., to RAI Research Corp. Separator membranes for redox-type electrochemical cells. 4,468,441, Cl. 429-105.000.

Dahl, Friedhelm: *See*—
Shaw, Peter M.; and Dahl, Friedhelm, 4,468,811, Cl. 383-5.000.

Dahl, Hans, to Escher Wyss GmbH. Band press for a fiber web. 4,468,287, Cl. 162-358.000.

Dahlberg, Reinhard, to Higratherm Electric GmbH. High power field effect transistor. 4,468,683, Cl. 357-23.000.

Dahlke, Charles. Locating arrangement for building wiring installation. 4,467,514, Cl. 29-407.000.

Dahmen, Karl G.; and Erikason, Roger, to Stal Laval Apparat AB. Leak detection in heat exchanger tubes and their tube sheet connections. 4,467,635, Cl. 73-40.50R.

Dai Nippon Printing Co., Ltd.: *See*—
Fujita, Shuji; Sugizaki, Kennosuke; and Kiyota, Keiichi, 4,468,693, Cl. 358-78.000.

Daigle, Louis J. L.; Paine, Donald C.; and Bednarczyk, Anthony J., to United Technologies Corporation. Optically-triggered half-frequency AC converter. 4,468,726, Cl. 363-161.000.

Daimler-Benz Aktiengesellschaft: *See*—
Braatz, Andreas; Weintz, Johann; and Kurz, Wolf-Dieter, 4,467,747, Cl. 123-41.120.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Sakamoto, Takashi, 4,468,442, Cl. 430-30.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Miyasaka, Eiji, 4,468,116, Cl. 355-54.000.
Yamada, Mitsuhiko; Nishida, Tukasa; and Inoue, Toshifumi, 4,468,692, Cl. 358-76.000.

d'Alayer de Costemore d'Arc, Stephane M., to Staar S.A. Method for automatically brewing coffee and machine therefor. 4,468,406, Cl. 426-231.000.

Dantlgraber, Jorg, to Mannesmann Rexroth GmbH. Control device for a variable displacement pump. 4,468,173, Cl. 417-220.000.

Dappen, Glen M.: *See*—
Babb, Bruce E.; and Dappen, Glen M., 4,468,467, Cl. 436-97.000.

Daryl Laboratories, Inc.: *See*—
Chen, Anthony B.; Harte, Richard A.; and Kaufman, Nancy K., 4,468,371, Cl. 422-102.000.

Data General Corporation: *See*—
Blau, Jonathan S.; and Beauchamp, Robert W., 4,468,748, Cl. 364-748.000.

Daussan, Andre : *See*—
Daussan, Jean-Charles; Daussan, Andre ; and Daussan, Gerard, 4,468,012, Cl. 266-220.000.

Daussan et Compagnie: *See*—
Daussan, Jean-Charles; Daussan, Andre ; and Daussan, Gerard, 4,468,012, Cl. 266-220.000.

Daussan, Gerard: *See*—
Daussan, Jean-Charles; Daussan, Andre ; and Daussan, Gerard, 4,468,012, Cl. 266-220.000.

Daussan, Jean-Charles; Daussan, Andre ; and Daussan, Gerard, to Daussan et Compagnie. Device for the removal of inclusions contained in molten metals. 4,468,012, Cl. 266-220.000.

Davidson, Mark C.: *See*—
Handrus, Jonathan D., 4,467,744, Cl. 119-2.000.

Davis, John B.; and Gilchrist, H. Glen, to Golder Associates Ltd. Underwater structure and method for its construction. 4,468,156, Cl. 405-222.000.

Davis, R. M., to Cincinnati Electronics Corporation. Apparatus for determining interval between two events. 4,468,746, Cl. 364-569.000.

Davis, Robert C., to Harris Corporation. Nonlinear equalizer for correcting intersymbol interference in a digital data transmission system. 4,468,786, Cl. 375-11.000.

Dawson, Ronald G.: *See*—
Mueller, Joseph H.; Dawson, Ronald G.; and Irwin, Samuel N., 4,468,712, Cl. 360-106.000.

Dazzi, Jean-Louis, to Renault Vehicules Industriels. Injector system for an internal combustion engine. 4,467,757, Cl. 123-198.0DB.

de Asis Manuel Serrano, Francisco: *See*—
Lamy, Jacques E.; and de Asis Manuel Serrano, Francisco, 4,468,152, Cl. 405-61.000.

DeBeni, Gianfranco, to European Atomic Energy Community (Euratom). Device for passive heat transport and integrated solar collector incorporating same. 4,467,862, Cl. 165-104.220.

Debets, Wilhelmus A. M.: *See*—
Schepers, Herman A. J.; and Debets, Wilhelmus A. M., 4,468,487, Cl. 524-87.000.

DeClaire, Gerald; and Kramer, Dennis, to Rockwell International Corporation. Vehicle drive control system. 4,467,886, Cl. 180-197.000.

de Crombrugghe, Alain. Pipe coupling system. 4,468,057, Cl. 285-373.000.

Deere & Company: *See*—
Lange, Henry J., 4,467,753, Cl. 123-195.00A.

DeGennaro, Alfred A. Foldable wearing apparel. 4,467,477, Cl. 2-94.000.

Degrassi, Alfieri; Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; and Mason, Charles D., to Allied Corporation. Blends of polyamide and ethylene vinyl alcohol copolymers. 4,468,427, Cl. 428-220.000.

Degroot, Rudolph C., Sr.: *See*—
Potjes, Robert A.; and Degroot, Rudolph C., Sr., 4,467,615, Cl. 62-158.000.

Degussa Aktiengesellschaft: *See*—
Hausselt, Jurgen; Schiwiora, Harry; Stumke, Manfred; and Lutz, Klaus, 4,468,251, Cl. 106-1.180.

Deininger, Gunter: *See*—
Bruderreck, Hartmut; Deininger, Gunter; Gottlieb, Klaus; Wehmeier, Friedel-Heinrich; and Haselhorst, Manfred, 4,468,233, Cl. 44-56.000.

Deka Plastics, Inc.: *See*—
Hummer, Gilbert C., 4,467,934, Cl. 220-85.00H.

Dekker, Paul R. Reversible hair and clothing brush. 4,467,491, Cl. 15-106.000.

de Lappe, Brock W.; Risebrough, Robert W.; Walker, Wayman, II; and Colledge, Edwin H., to University of Calif., The Regents of the. Filtration and extraction apparatus. 4,468,324, Cl. 210-350.000.

Denis, Jean. Felling head. 4,467,849, Cl. 144-34.00R.

Denley, Ronald S., to Oak Industries, Inc. Keyboard space bar stabilizer. 4,468,145, Cl. 400-496.000.

de Nora, Oronzio; Nidola, Antonio; and Martelli, Gian N., to Oronzio deNora Impianti Elettrochimici S.p.A. Electrolysis cell. 4,468,311, Cl. 204-252.000.

de Putter, Warner Uan: *See*—
Beune, Joannes H.; and de Putter, Warner Uan, 4,468,367, Cl. 264-255.000.

Dequet, Jean W. Fishing rod. 4,467,549, Cl. 43-24.000.

DeSantis, Alfred J.; and Schibinger, Joseph S., to Burroughs Corporation. Mechanism for creating dependency free code for multiple processing elements. 4,468,736, Cl. 364-200.000.

Deslauriers, Clovis F. Waste stripper. 4,467,948, Cl. 225-97.000.

Deutsch, Leslie J.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,467,688, Cl. 84-1.010.

Deutsch, Ralph; and Deutsch, Leslie J., to Kawai Musical Instrument Mfg. Co., Ltd. Polyphonic musical tone generator. 4,467,688, Cl. 84-1.010.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Selectable ensemble effect in an electronic musical instrument. 4,467,691, Cl. 84-1.240.

Deutsche Gardner-Denver GmbH: *See*—
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., 4,467,877, Cl. 173-12.000.

Deutsche Texaco Aktiengesellschaft: *See*—
Rietsch, Eike, 4,468,761, Cl. 367-43.000.

DeWitt, Terry E.: *See*—
Long, Gene M.; DeWitt, Terry E.; and Bell, III: John R., 4,467,586, Cl. 52-748.000.

Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., to BASF Wyandotte Corporation. Polyurethanes prepared from polyoxyalkylenes containing alkaline catalyst residues chelated with benzoic acid derivatives. 4,468,478, Cl. 521-125.000.

Deyloff, John L., to Warner-Lambert Company. Medium for differentiating *Streptococcus mutans*. 4,468,456, Cl. 435-36.000.

Dezen, Vittorio. Paint roller. 4,467,509, Cl. 29-116.00R.

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Solomon, Frank, 4,468,362, Cl. 264-127.000.

Dibbern, John E., Jr.: *See*—
Sauerwein, William D.; Weber, Steve A.; and Dibbern, John E., Jr., 4,467,896, Cl. 188-69.000.

Dickson, David M.: *See*—
Burcher, Dennis S.; Dickson, David M.; and Walters, Jeffrey A., 4,468,701, Cl. 358-181.000.

Didier Engineering GmbH: *See*—
Galow, Manfred; Flockenhaus, Claus; Meckel, Joachim; Joseph, Horst G.; and Gabriel, Gunter, 4,468,288, Cl. 201-41.000.

Didier-Werke A.G.: *See*—
Schellberg, Franz; Kauffeisen, Bernard; Oberbach, Manfred; Zingel, Gerhard; and Wieland, Gunter, 4,468,780, Cl. 373-75.000.

Diesel Kiki Co., Ltd.: *See*—
Shibuya, Tsunenori, 4,468,180, Cl. 418-15.000.

Dietmann, Karl: *See*—
Michel, Helmut; Kampe, Wolfgang; Ofenloch, Roland; Dietmann, Karl; and Spoaer, Gisbert, 4,468,520, Cl. 424-274.000.

Di Fonzo, Mark A., to Kelley Company, Inc. Steam injection system for an incinerator. 4,467,731, Cl. 110-235.000.

Di Gianfilippo, Aleandro; and Figler, Alan A., to Baxter Travenol Laboratories, Inc. Flow monitoring method and apparatus. 4,467,844, Cl. 141-1.000.

Dillon, Nicholas T. E. Oxy cutting torch. 4,468,007, Cl. 266-48.000.

Director General of the Agency of Industrial Science and Technology: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, 4,468,458, Cl. 435-134.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.

Disko, Harry: *See*—
Kulesza, Ralph J.; Kulesza, Wayne A.; Arias, Henry; and Disko, Harry, 4,468,029, Cl. 273-108.000.

Dixon, Robert C.; Poland, Ronald D.; Stoll, Bradley G.; and Okashima, Bob Y., to General Electric Company. Jet pump plug. 4,468,172, Cl. 417-151.000.

Do, Michihisa: *See*—
Mori, Shunji; Yamada, Hiromitsu; Takeuchi, Kunihiko; and Do, Michihisa, 4,468,808, Cl. 382-20.000.

Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., to Storage Technology Corporation. Detection of sequential data stream for improvements in cache data storage. 4,468,730, Cl. 364-200.000.

Donaldson, Edward; and Frisk, Kenneth A. A., to 103100 Canada Inc. Low profile axial flow combine. 4,467,818, Cl. 130-27.00T.

Dondero, John D.: *See*—
Gregory, John R.; Parks, Gerald; and Dondero, John D., 4,467,475, Cl. 2-2.000.

Donohue, George L.: *See*—
Dube, C. Michael; Donohue, George L.; and Blackwelder, Ronald A., 4,467,658, Cl. 73-861.080.

Donomoto, Tadashi; Tatematsu, Yoshiaki; and Tanaka, Atsuo, to Toyota Jidosha Kabushiki Kaisha. Composite material manufacturing method exothermically reducing metallic oxide in binder by element in matrix metal. 4,468,272, Cl. 156-280.000.

Doran, Samuel K.: *See*—
Blair, William W.; Doran, Samuel K.; and Langner, Guenther O., 4,468,565, Cl. 250-491.100.

Dornbusch, Arthur H.; and Blaut, Robert W., to Procter & Gamble Company, The. Dividable display and shipping container. 4,467,923, Cl. 206-602.000.

Dorr-Oliver Incorporated: *See*—
Freeman, Mark P.; and Klinkowski, Peter R., 4,468,306, Cl. 204-180.00P.

Doswald, Paul; Moricosi, Emil; Moser, Helmut; and Schmid, Horst, to Sandoz Ltd. Sulfo group-free disazo and polyazo compounds containing at least two basic or cationic group and which are in metal-free or 2:1 metal complex form. 4,468,347, Cl. 260-147.000.

Dow Chemical Company, The: *See*—
Crump, Druce K.; and Wilson, David A., 4,468,252, Cl. 106-90.000.
Lysenko, Zenon; and Pews, Richard G., 4,468,354, Cl. 260-465.700.
Parker, Theodore L., 4,468,507, Cl. 525-491.000.
Rigterink, Raymond H.; and Sbragia, Ronald J., 4,468,405, Cl. 424-322.000.

Downey, Robert C., Jr., to Harsco Corporation. Door with guide insulation and weatherstripping. 4,467,853, Cl. 160-133.000.

Doyle, Howard E., Jr. Combination weathervane heat exchanger. 4,467,960, Cl. 237-55.000.

Dragerwerk Aktiengesellschaft: *See*—
Eckstein, Wolfgang, 4,467,795, Cl. 128-201.250.

Dragone, Corrado, to Bell Telephone Laboratories, Incorporated. Wide bandwidth hybrid mode feeds. 4,468,672, Cl. 343-783.000.

Drake, Harry W. Apparatus and process for drying lumber. 4,467,532, Cl. 34-16.500.

Dresser Industries, Inc.: *See*—
Shore, Daniel B.; and Chatterjea, Probir K., 4,467,900, Cl. 192-13.00R.

Dril Quip, Inc.: *See*—
Reimert, Larry E., 4,468,055, Cl. 285-141.000.

Drolet, Jean P.; and Chevalier, Jean P., to Societe Nationale de Lamiante. Protoenstatite ceramic units and process for their preparation. 4,468,473, Cl. 501-155.000.

Du, Benjamin R. Apparatus and method for dispensing beverage syrup. 4,467,941, Cl. 222-1.000.

Dual Fuel Systems, Inc.: *See*—
Gneiding, Donald R., 4,467,828, Cl. 137-484.400.

Dube, C. Michael; Donohue, George L.; and Blackwelder, Ronald A., to Dynamics Technology, Inc. Hydro resistance anemometer. 4,467,658, Cl. 73-861.080.

Duboy, Gustavo. Battery-powered propulsion unit for a diver. 4,467,742, Cl. 114-315.000.

Ducios, Clovis R. Golf club loft and lie angle indicating device. 4,468,034, Cl. 273-183.00D.

Duda, Craig R.: *See*—
Hartouni, Edward; and Duda, Craig R., 4,468,117, Cl. 356-73.100.
Dugan, Charles; and Dugan, Timothy, to Farm Fresh Shrimp Corporation. Method and apparatus for rearing post-larvae shrimp. 4,467,743, Cl. 119-2.000.
Dugan, Timothy: *See*—
Dugan, Charles; and Dugan, Timothy, 4,467,743, Cl. 119-2.000.
Duncan, Budd L.: *See*—
Sakowski, Walter J.; Bajaj, Manohar C.; and Duncan, Budd L., 4,468,377, Cl. 423-474.000.
Dunn, Charles S.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Method and apparatus for feeding raw material to a furnace. 4,468,164, Cl. 414-165.000.
Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., to EPSCO, Inc. Navigational plotting system. 4,468,743, Cl. 364-520.000.
Du Pont de Nemours, E. I., and Company: *See*—
Antle, Paul E.; Schmit, John A.; and Smith, Edward L., 4,468,331, Cl. 210-659.000.
Ben, Victor R., 4,468,433, Cl. 428-372.000.
Bowen, Michael W.; and Parrish, Robert G., 4,468,505, Cl. 525-432.000.
Brown, Clyde P., 4,468,454, Cl. 430-569.000.
Hatchadoorian, Edward; Ostapchenko, George J.; and Young, Harlan S., 4,468,426, Cl. 428-213.000.
Dusch, Albert: *See*—
Walther, Karl-Heinz; Vollmar, Kurt; and Dusch, Albert, 4,467,738, Cl. 112-129.000.
Duttweiler, Donald L.; Gritton, Charles W. K.; and Tao, Ying G., to AT&T Bell Laboratories. Adaptive filter update normalization. 4,468,641, Cl. 333-166.000.
Dvorsky, Drahomir; and Cerovsky, Karel, to Vykumny ustav zuslechtovaci. Quaternary ammonium compounds and method for preparation thereof. 4,468,228, Cl. 8-188.000.
Dyer, Arthur M. Float valve assembly. 4,467,482, Cl. 4-393.000.
Dynamics Technology, Inc.: *See*—
Dube, C. Michael; Donohue, George L.; and Blackwelder, Ronald A., 4,467,658, Cl. 73-861.080.
Dynamit Nobel AG: *See*—
Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, 4,468,353, Cl. 260-465.400.
Dynamit Nobel Aktiengesellschaft: *See*—
Gauchel, Peter; and Kurth, Josef, 4,468,369, Cl. 264-560.000.
Dyneer Corporation: *See*—
McCutchan, Ben O., Jr., 4,468,210, Cl. 474-170.000.
Dynie, Ernest R., to Black & Decker Inc. Rotor comb construction for power lawn rake and method of assembly therefor. 4,467,591, Cl. 56-16.400.
Dziedzic, Edward, to A. B. Chance Company. Internally driven earth anchor having small diameter anchor rod. 4,467,575, Cl. 52-157.000.
Dziura, Walter H.: *See*—
Snyder, George R.; and Dziura, Walter H., 4,467,907, Cl. 198-368.000.
E.D.M. Corporation: *See*—
Adachi, Takato, 4,468,274, Cl. 156-320.000.
E. & J. Gallo Winery: *See*—
Vella, Peter J., 4,468,407, Cl. 426-592.000.
E. R. Squibb & Sons, Inc.: *See*—
Krapcho, John, 4,468,519, Cl. 548-409.000.
Early, Allen D.; Cawlfield, David W.; Walker, Trevor; and Weisman, Paul T., to Procter & Gamble Company, The. Hydrophilic microfibrous absorbesit webs. 4,468,428, Cl. 428-221.000.
Eastman Kodak Company: *See*—
Babb, Bruce E.; and Dappen, Glen M., 4,468,467, Cl. 436-97.000.
Contois, Lawrence E., 4,468,444, Cl. 430-72.000.
Meyer, Max F., Jr.; and McConnell, Richard L., 4,468,490, Cl. 524-311.000.
Morris, John C.; and Jackson, Winston J., Jr., 4,468,510, Cl. 528-298.000.
Pierson, Charles W., 4,468,271, Cl. 156-220.000.
Van Sickle, Dale E.; Newland, Gordon C.; Siirola, Jeffrey J.; and Cook, Steven L., 4,468,356, Cl. 260-544.00Y.
Eaton Corporation: *See*—
Vander Meer, James C.; and Spink, Robert W., 4,468,603, Cl. 318-779.000.
Ebihara, Hideyuki: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,468,068, Cl. 312-333.000.
Eckstein, Wolfgang, to Dragerwerk Aktiengesellschaft. Breathing device package. 4,467,795, Cl. 128-201.250.
Ecopool Design Limited: *See*—
Bastenhof, Dirk, 4,467,483, Cl. 4-491.000.
Edgar, Albert D., to International Business Machines Corporation. Apparatus and method for remote displaying and sensing of information using shadow parallax. 4,468,694, Cl. 358-93.000.
Edmonds, Eric J. F.: *See*—
Birch, Stanley A.; Jackson, Sidney B.; Edmonds, Eric J. F.; Gigg, Robert V.; and Haggert, Norman L., 4,467,986, Cl. 244-147.000.
Egan, William H. Stringed musical instrument with improved base and sound box. 4,467,692, Cl. 84-291.000.
Eguchi, Kiyoshi: *See*—
Genba, Yasushi; Tamaru, Shigemi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,081, Cl. 339-176.00M.
Kodera, Toshihiko; Eguchi, Kiyoshi; Ishikawa, Takayoshi; Genba, Yasushi; Tamaru, Shigemi; and Satou, Susumu, 4,468,533, Cl. 200-153.0SC.
Tamaru, Shigemi; Genba, Yasushi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,082, Cl. 339-176.00M.
Eichhorn, Hans-Gunther; and Gramss, Jurgen. Corpuscular beam control circuit arrangement. 4,468,566, Cl. 250-492.200.
Eidmann, Jurgen: *See*—
Strulik, Wilhelm P.; and Eidmann, Jurgen, 4,467,824, Cl. 137-74.000.
Eisai Co., Ltd.: *See*—
Machida, Yoshimasa; Saito, Isao; Sugiyama, Isao; Negi, Shigeto; Nomoto, Seiichiro; Ikuta, Hirosori; Yamauchi, Hiroshi; and Kitoh, Kyosuke, 4,468,394, Cl. 424-246.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, 4,468,458, Cl. 435-134.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.
Eisenhuth, Ludwig; Zengel, Hans G.; and Bergfeld, Manfred, to Akzona Incorporated. Process for the preparation of thiuram disulfides. 4,468,526, Cl. 564-76.000.
Eisenstein, Stephen E.: *See*—
Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., 4,468,478, Cl. 521-125.000.
Eklund, Tore; and Schmidt, Torbjorn, to NYA Varmlands Limtra Aktiebolag. Method of fluid pressure laminating assembled wood segments to form wood poles. 4,468,273, Cl. 156-286.000.
Eldin, Sameer H.: *See*—
Zahir, Sheik A.; and Eldin, Sameer H., 4,468,524, Cl. 560-221.000.
Eldridge, William J.: *See*—
Barda, Henry J.; Sutker, Burton J.; and Eldridge, William J., 4,468,481, Cl. 521-171.000.
Barda, Henry J.; Sutker, Burton J.; and Eldridge, William J., 4,468,482, Cl. 521-171.000.
Electricite de France (Service National): *See*—
Gourdenne, Albert; and Heintz, Pascal, 4,468,485, Cl. 523-137.000.
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Hillis, Maurice R., 4,468,305, Cl. 204-130.000.
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Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,468,395, Cl. 424-246.000.
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Cooper, Robin D. G., 4,468,514, Cl. 544-027.000.
Hahn, Richard A., 4,468,401, Cl. 424-258.000.
Kirst, Herbert A.; and Toth, John E., 4,468,511, Cl. 536-7.100.
Kirst, Herbert A.; and Truedell, Brenda A., 4,468,512, Cl. 536-16.800.
Kirst, Herbert A.; and Truedell, Brenda A., 4,468,513, Cl. 536-16.800.
Malin, Nancy E.; Fayerman, Jeffrey T.; Jones, Michael D.; Mabe, James A.; and Nakatsukasa, Walter M., 4,468,462, Cl. 435-253.000.
Marzoni, Gifford P., 4,468,517, Cl. 548-189.000.
O'Doherty, George O. P.; and Clinton, Albert J., 4,468,380, Cl. 424-114.000.
Pioch, Richard P., 4,468,399, Cl. 424-251.000.
Ellen, Peter E. Hydraulic jacks. 4,467,702, Cl. 92-108.000.
Ellingson, Gary L.; and Miller, Wendell E., to Polar Research, Inc. Antenna tower assembly and method of attaching antennas. 4,468,671, Cl. 343-766.000.
Ellis Corporation: *See*—
Fesmire, Robert H.; and Hansen, Warren T., 4,467,530, Cl. 34-8.000.
Ellis, George W.: *See*—
Baker, Lewin T.; Bose, Sanjay K.; Ellis, George W.; and Puckette, Charles M., 4,468,792, Cl. 375-45.000.
Ellis Paperboard Products, Inc.: *See*—
Horne, Fred H., 4,467,728, Cl. 108-51.100.
Ellis, Stafford M., to Marconi Avionics Limited. Night vision goggles. 4,468,101, Cl. 350-538.000.
Emerson Electric Co.: *See*—
Behr, Joseph L.; and Hargraves, David P., 4,467,613, Cl. 62-115.000.
Cunningham, Donald M.; and Stover, John C., 4,468,556, Cl. 219-523.000.
Endeavor Corp.: *See*—
Gottlieb, A. Arthur, 4,468,379, Cl. 424-101.000.
Ender, Hans G. Instrumentarium for reducing and fixing of pertrochanterous and subtrochanterous fractures as well as insert member forming part of this instrumentarium. 4,467,793, Cl. 128-92.0BC.
Enders, George E., to NRM Corporation. Tire building machine. 4,468,275, Cl. 156-401.000.
Engeler, William E.; and Mazin, Moshe, to General Electric Company. Dual gate CMOS transistor circuits having reduced electrode capacitance. 4,468,574, Cl. 307-451.000.
Entenmann, Robert: *See*—
Rohde, Siegfried; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; and Schramm, Herbert, 4,467,634, Cl. 73-35.000.
Enzmann, Dieter R.; and Lundquist, Ingemar, to Advanced Cardiovascular Systems, Inc. System and method for catheter placement in blood vessels of a human patient. 4,468,224, Cl. 604-247.000.
EPSCO, Inc.: *See*—
Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., 4,468,743, Cl. 364-520.000.
Erckelboudt, Andre : *See*—
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Ericsson, Bjorn E.: *See—*
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Eriksson, Roger: *See—*
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Eschenbach, Paul W., to Milliken Research Corporation. Spun-like textured yarn. 4,467,594, Cl. 57-207.000.

Escher Wyss GmbH: *See—*
Dahl, Hans, 4,468,287, Cl. 162-358.000.

Eskuchen, Frank G.: *See—*
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Eskuchen, Leonard G.: *See—*
Lindholm, Wayne R., 4,467,678, Cl. 81-483.000.

Eskuchen, Raymond F.: *See—*
Lindholm, Wayne R., 4,467,678, Cl. 81-483.000.

Esser, Leonard J. M.; and Heldens, Ludovicus G. M., to U.S. Philips Corporation. High-density charge-coupled devices with complementary adjacent channels. 4,468,684, Cl. 357-24.000.

Esteve, Daniel: *See—*
Levallois, Emile; Szabo, Rene ; Clot, Jean; and Esteve, Daniel, 4,468,155, Cl. 405-170.000.

Etablissement Sideco International: *See—*
Tcheraz, Patrick, 4,468,225, Cl. 604-248.000.

Ethyl Corporation: *See—*
Barda, Henry J., 4,468,479, Cl. 521-171.000.
Barda, Henry J., 4,468,480, Cl. 521-171.000.
Barda, Henry J.; Sutker, Burton J.; and Eldridge, William J., 4,468,481, Cl. 521-171.000.
Barda, Henry J.; Sutker, Burton J.; and Eldridge, William J., 4,468,482, Cl. 521-171.000.

European Atomic Energy Community (Euratom): *See—*
DeBeni, Gianfranco, 4,467,862, Cl. 165-104.220.

Everdyke, Jonathan C.: *See—*
McIntosh, George C.; Everdyke, Jonathan C.; and Schutte, Marlin D., 4,468,129, Cl. 366-213.000.

Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., to International Flavors & Fragrances Inc. Synthesis of triconjugated dienones and novel intermediates used in said process. 4,467,820, Cl. 131-276.000.

Eversman Mfg. Company, The: *See—*
Wittrock, Michael C., 4,467,874, Cl. 172-548.000.

EVG Entwicklungs-und Verwertungs-Gesellschaft mbH.: *See—*
Gott, Hans; Scherr, Rudolf; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,468,550, Cl. 219-56.000.

Evjen, John M., to General Electric Company. Air heating and cooling system for aircraft batteries. 4,468,440, Cl. 429-8.000.

Excor, Inc.: *See—*
Pyle, Stoddard H., 4,467,686, Cl. 83-478.000.
Thorsell, Roland H., 4,467,684, Cl. 83-404.100.
Thorsell, Roland H., 4,467,685, Cl. 83-478.000.

Exner, Gunter; and Monkeberg, Karlheinz, to Fulgurit GmbH & Co. Kommanditgesellschaft. Process for imparting surface-structures to wood-cement boards. 4,468,361, Cl. 264-119.000.

Exxon Research and Engineering Co.: *See—*
Bartok, William; Freund, Howard; and Liotta, Ronald, 4,468,231, Cl. 44-1.00R.
Burton, Jack D., 4,468,705, Cl. 358-284.000.
Martner, John G., 4,468,680, Cl. 346-140.00R.
Rhodes, Richard P.; and Rose, Kenneth D., 4,468,314, Cl. 208-8.00R.

Eyre, David L.: *See—*
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Fabrica D'Armi P. Beretta S.p.A.: *See—*
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Fabrik, Inc.: *See—*
McBride, James W., 4,468,419, Cl. 427-266.000.

Facit Aktiebolag: *See—*
Rosza, Kalman, 4,468,141, Cl. 400-124.000.

Fair, Jerry R.: *See—*
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Fairchild, William G.: *See—*
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Faiveley S.A.: *See—*
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Falge, John J.; Albanese, James A.; Loran, Arthur W.; and Locklin, E. Alan. Security device for basement windows. 4,467,574, Cl. 52-106.000.

Farm Fresh Shrimp Corporation: *See—*
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Farnhill, William M.: *See—*
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Farrell, Roscoe M.: *See—*
Coble, William H.; Shields, Harper; and Farrell, Roscoe M., 4,467,626, Cl. 66-196.000.

Farrington, Douglas L., to Sealed Air Corporation. Reel system for swimming pool covers. 4,467,978, Cl. 242-86.520.

Farrow, Robin F. C.; and Robertson, Daniel S. Infrared detector using grey tin. 4,468,685, Cl. 357-30.000.

Fayerman, Jeffrey T.: *See—*
Malin, Nancy E.; Fayerman, Jeffrey T.; Jones, Michael D.; Mabe, James A.; and Nakatsukasa, Walter M., 4,468,462, Cl. 435-253.000.

Featherman, Bernard: *See—*
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Featherman, Daniel J., to Featherman, Franklyn; and Featherman, Bernard. Wide span shelving. 4,467,729, Cl. 108-107.000.

Featherman, Franklyn: *See—*
Featherman, Daniel J., 4,467,729, Cl. 108-107.000.

Federated Farmers of New Zealand: *See—*
McCallum, Bruce D.; and McCallum, Scott J., 4,467,890, Cl. 182-206.000.

Feese, Wolfgang; and Vogelsberg, Dieter, to Siemens Aktiengesellschaft. SZ Twisting device for elements of electric cables and lines to be twisted. 4,467,596, Cl. 57-293.000.

Feldmuhle Aktiengesellschaft: *See—*
Munch, Manfred, 4,468,200, Cl. 433-174.000.

Fengler, Gerd; Botta, Artur; Scheer, Martin; and Berschauer, Friedrich, to Bayer Aktiengesellschaft. Sulphinyl- and sulphonyl-azacycloheptan-2-ones, and their use as feed additives. 4,468,392, Cl. 424-244.000.

Fenne, Ivor; and Mowbray, Dorian F., to Lucas Industries Public Limited Company. Fuel injection pumping apparatus. 4,468,179, Cl. 417-462.000.

Fenwick, Danny L.: *See—*
Clark, Paul M.; Fenwick, Danny L.; and Hopkins, Jon D., 4,468,532, Cl. 200-81.90R.

Feramatic AG: *See—*
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Ferber, Alan: *See—*
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Fesmire, Robert H.; and Hansen, Warren T., to Ellis Corporation. Method and apparatus for batch continuous laundry processing. 4,467,530, Cl. 34-8.000.

Fiber Controls Corporation: *See—*
Lytton, Glenn E.; Fair, Jerry R.; and Nash, Ronald S., 4,467,502, Cl. 19-80.00R.

Field, Robert C., to Canadian National Railway Company. Radio channel visual identification system. 4,468,814, Cl. 455-159.000.

Figler, Alan A.: *See—*
Di Gianfilippo, Aleandro; and Figler, Alan A., 4,467,844, Cl. 141-1.000.

Fimoff, Mark J.: *See—*
Stier, Glenn R.; and Fimoff, Mark J., 4,467,689, Cl. 84-1.030.

Fincham, James R. Wood baler. 4,467,712, Cl. 100-8.000.

Fischer, Rolf: *See—*
Weitz, Hans-Martin; and Fischer, Rolf, 4,468,525, Cl. 560-244.000.

Fischer, Werner; and Locher, Johannes, to Robert Bosch GmbH. Control apparatus for a fuel metering system. 4,467,762, Cl. 123-357.000.

Fish, Warren H.; and Sunnarborg, Robert P., to Whirlpool Corporation. Vacuum cleaner nozzle lift device. 4,467,495, Cl. 15-354.000.

Fishgal, Semyon I.: *See—*
McGhie, James R.; and Fishgal, Semyon I., 4,468,047, Cl. 280-419.000.

Fitzgerald, Edward A.; and Pfeffer, Darrell A., to Motorola, Inc. Timed voltage clamp for battery charger. 4,468,605, Cl. 320-36.000.

FitzGerald, James P.: *See—*
FitzGerald, Joseph M.; and FitzGerald, James P., 4,468,060, Cl. 296-1.00S.

FitzGerald, Joseph M.; and FitzGerald, James P. Aerodynamic enclosure with a condenser inlet cover. 4,468,060, Cl. 296-1.00S.

Fjalstrom, Bengt G. Machine for cutting of armored or reinforced hoses. 4,467,508, Cl. 29-33.00T.

Flakt AB: *See—*
Karlsson, Ingemar; Svensson, Percyval; Nelenius, Eric; Svensson, Goran; Ydrefors, Axel; and Lindstrom, Bengt, 4,467,950, Cl. 226-91.000.

Flannagan, Stephen T.: *See—*
Kung, Roger I.; Spitz, Jonathan N.; and Flannagan, Stephen T., 4,468,759, Cl. 365-201.000.

Fleer Corp.: *See—*
Mustin, Frank H., 4,468,028, Cl. 273-85.00R.

Fleming, Dennis J.: *See—*
Marcus, Konrad H.; and Fleming, Dennis J., 4,468,062, Cl. 296-97.00G.

Flockenhaus, Claus: *See—*
Galow, Manfred; Flockenhaus, Claus; Meckel, Joachim; Joseph, Horst G.; and Gabriel, Gunter, 4,468,288, Cl. 201-41.000.

Floryan, Daniel E.: *See—*
Holub, Fred; Floryan, Daniel E.; ar 1 White, Dwain M., 4,468,506, Cl. 525-432.000.

Flynn, Robert G.: *See—*
Mitra, Arun K.; and Flynn, Robert G., 4,468,381, Cl. 424-158.000.

FMC Corporation: *See—*
Jameson, Neal E., 4,468,166, Cl. 414-690.000.
White, Bruce W., 4,467,928, Cl. 212-182.000.

Fogarty, John E., Jr.; and Anderson, Robert W., Jr., to Thermoplas Machinery, Inc. Slide plate screen changer. 4,468,322, Cl. 210-236.000.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Safety belt roll-up device. 4,467,980, Cl. 242-107.40B.

Fokos, Robert F.; and Alden, Dale E., to Special Products Engineering Corporation. Alignment system for a rotary cutter. 4,467,687, Cl. 83-674.000.

Foley, James W., to Polaroid Corporation. Photographic products and processes. 4,468,451, Cl. 430-222.000.

Foley, James W.: *See*—
Arbree, Roberta R.; Foley, James W.; and Meneghini, Frank A., 4,468,449, Cl. 430-222.000.

Ford Aerospace & Communications Corporation: *See*—
Hansen, Stanley W.; Terleski, John D.; and Whaley, Mark D., 4,468,738, Cl. 364-200.000.

Formall Syn-Trac Systems, Inc.: *See*—
Forshee, David J., 4,467,911, Cl. 198-648.000.
Salloum, James S., 4,467,913, Cl. 198-687.000.

Formica Corp.: *See*—
Clarke, Theodore R.; and Hosler, John F., 4,468,264, Cl. 156-62.200.

Forsberg, John W.: *See*—
Rysek, Joseph J.; and Forsberg, John W., 4,468,339, Cl. 252-75.000.

Forshee, David J., to Formall Syn-Trac Systems, Inc. Plastic clevis for conveyor trolley and hanger. 4,467,911, Cl. 198-648.000.

Forster, Franz, to Linde Aktiengesellschaft. Hydrostatic drive system for an excavator. 4,467,604, Cl. 60-484.000.

Fortuna, Vincent E.: *See*—
MacLaughlin, Donald; and Fortuna, Vincent E., 4,468,265, Cl. 156-64.000.

Foseco International Limited: *See*—
Trinkl, Gerd; and Schopp, Helmut, 4,467,858, Cl. 164-360.000.

Fowles, Thomas A.: *See*—
Schnell, William J.; Fowles, Thomas A.; and Henhapl, Albert, 4,467,930, Cl. 215-32.000.

Francovitch, Thomas F., to Single-Ply Institute of America, Inc. Membrane anchor system with metal body. 4,467,581, Cl. 52-410.000.

Frank, Siegfried: *See*—
Janssen, Klaus; Meier, Jurgen; and Frank, Siegfried, 4,468,154, Cl. 405-128.000.

Franke, David M. Breathing effort reduction device for scuba gear. 4,467,797, Cl. 128-204.260.

Frantz, Virgil L., to Roanoke College. Twin tower assembly for decontaminating compressed gas. 4,468,239, Cl. 55-162.000.

Franz, Klaus-Dieter: *See*—
Naarmann, Herbert; Muench, Volker; and Franz, Klaus-Dieter, 4,468,509, Cl. 526-284.000.

Franz Sagemuller GmbH: *See*—
Sagemuller, Franz, 4,467,970, Cl. 241-101.200.

Frear, David L.; Punako, Stephen; MacAvoy, David W.; and Gallusser, David O., to Bendix Corporation, The. Forwardly removable coupling ring for an electrical connector. 4,468,078, Cl. 339-90.00R.

Freeman, D. Bruce; Kesse, Bernard G.; and Thiel, Philip P., to Louis G. Freeman Company, The. Process for applying thermoplastic adhesive to flexible die-cut parts. 4,468,418, Cl. 427-208.200.

Freeman, Mark P.; and Klinkowski, Peter R., to Dorr-Oliver Incorporated. Biodic electrofiltration. 4,468,306, Cl. 204-180.00P.

Freese, Uwe E.: *See*—
Goepp, Robert A.; and Freese, Uwe E., 4,467,789, Cl. 128-1.00R.

Freitag, Herbert: *See*—
Molders, Werner; Freitag, Herbert; and Smith, Lawther O., 4,467,899, Cl. 188-320.000.

French, George F. Fluid-logic thyristor. 4,467,831, Cl. 137-625.270.

Frese, Georg; and Siebold, Horst, to Siemens Aktiengesellschaft. Gradient coil system for nuclear magnetic resonance apparatus. 4,468,622, Cl. 324-319.000.

Freund, Howard: *See*—
Bartok, William; Freund, Howard; and Liotta, Ronald, 4,468,231, Cl. 44-1.00R.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Knuth, Manfred; and Homann, Thorsten, 4,467,713, Cl. 100-37.000.

Friedel, Rudolf; and Geldner, Ernst, to Siemens Aktiengesellschaft. Rotary anode X-ray tube. 4,468,800, Cl. 378-131.000.

Friedel, Rudolf, to Siemens Aktiengesellschaft. X-Ray tube. 4,468,802, Cl. 378-140.000.

Friedman, Morris, to United Steel Service, Inc. Slitter apparatus. 4,467,975, Cl. 242-564.000.

Frisk, Kenneth A. A.: *See*—
Donaldson, Edward; and Frisk, Kenneth A. A., 4,467,818, Cl. 130-27.00T.

Frommberz, Egon, to Rotzler GmbH and Co. Spezialfabrik fur Seilwinden und Hebezeuge. Continuous winch. 4,468,006, Cl. 254-389.000.

Frueh, Eric L.: *See*—
Parker, Peter D.; and Frueh, Eric L., 4,468,302, Cl. 204-108.000.

Fuchser, Troy D.: *See*—
Johnson, Charles R.; Ward, Phillip W.; Lindley, Joe H.; Maher, Robert A.; Holmes, Jerry D.; and Fuchser, Troy D., 4,468,793, Cl. 375-97.000.

Fuderer, Andrija, to Union Carbide Corporation. Pressure swing adsorption with direct and indirect pressure equalizations. 4,468,237, Cl. 55-26.000.

Fuji Electric Company Limited: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.

Fuji Photo Film Co., Ltd.: *See*—
Mikami, Takeshi; and Hosoi, Noriyuki, 4,468,446, Cl. 430-138.000.
Nakamura, Shigeru; Ono, Shigetoshi; Suzuki, Seiji; and Suzuki, Hirohisa, 4,468,452, Cl. 430-223.000.
Okita, Tsutomu; and Masataka, Kiritani, 4,468,436, Cl. 428-423.300.

Fuji Xerox Co., Ltd.: *See*—
Fujiwara, Fukumi; and Arai, Yoshio, 4,468,703, Cl. 358-282.000.
Nakajima, Hisao; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,468,676, Cl. 346-76.0PH.
Wako, Shoji; and Todo, Hidemasa, 4,468,681, Cl. 346-153.100.

Fujii, Yoshikazu; Kondo, Tomizou; Shinonaga, Hideo; and Kitadono, Kaoru, to Sumitomo Chemical Company, Limited. Process for applying light- or radiation-curable resin composition to polyolefin moldings. 4,468,412, Cl. 427-38.000.

Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, to Fujimoto Pharmaceutical Corporation. Imidazole guanidine compounds and method of making same. 4,468,518, Cl. 548-342.000.

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Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,468,518, Cl. 548-342.000.

Fujio, Ichiro: *See*—
Kaneko, Masahiro; Asanuma, Tadashi; Uchikawa, Nobutaka; Fujio, Ichiro; and Shiomura, Tetsunosuke, 4,468,257, Cl. 134-22.130.

Fujioka, Yoshihide: *See*—
Ohba, Toshihiro; Kanatani, Yoshiharu; Kinoshita, Hiroshi; Sogabe, Morihisa; and Fujioka, Yoshihide, 4,468,659, Cl. 340-719.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,468,515, Cl. 548-128.000.

Fujita, Naoaki: *See*—
Takeda, Ryuichiro; and Fujita, Naoaki, 4,468,429, Cl. 428-283.000.

Fujita, Shuji; Sugizaki, Kennosuke; and Kiyota, Keiichi, to Dai Nippon Printing Co., Ltd.; and Ikegami Tsushinki Co., Ltd. Video printing apparatus. 4,468,693, Cl. 358-78.000.

Fujitani, Yugo: *See*—
Minamida, Kazukiyo; and Fujitani, Yugo, 4,467,880, Cl. 177-25.000.

Fujitsu Limited: *See*—
Fujiwara, Yoshiro; Kojima, Yuji; Yamada, Sumio; Hoshino, Hiroshi; and Wakatsuki, Noboru, 4,468,582, Cl. 310-312.000.
Kato, Seiji; Ueno, Norio; and Kakuishi, Mitsuo, 4,468,749, Cl. 364-861.000.
Takemae, Yoshihiro, 4,468,576, Cl. 307-481.000.
Tamura, Masayoshi; Kinoshita, Ryohei; Matsubayashi, Norio; Matsumoto, Mitsuharu; Sukeda, Toshiaki; and Hirakawa, Osamu, 4,468,075, Cl. 339-75.00M.
Yoshizaki, Tsutomu, 4,468,616, Cl. 324-158.00F.

Fujiwara, Akinori: *See*—
Tajima, Hiromi; and Fujiwara, Akinori, 4,467,982, Cl. 242-107.600.

Fujiwara, Fukumi; and Arai, Yoshio, to Fuji Xerox Co., Ltd. Image signal processing device. 4,468,703, Cl. 358-282.000.

Fujiwara, Haruyoshi; and Kadota, Yuji, to Mitsubishi Jukogyo Kabushiki Kaisha. Canvas roll arrangement. 4,467,536, Cl. 34-116.000.

Fujiwara, Yoshiro; Kojima, Yuji; Yamada, Sumio; Hoshino, Hiroshi; and Wakatsuki, Noboru, to Fujitsu Limited. Piezoelectric resonator chip and trimming method for adjusting the frequency thereof. 4,468,582, Cl. 310-312.000.

Fukaya, Hiroyasu: *See*—
Suzuki, Atsushi; Ninomiya, Masakazu; Fukaya, Hiroyasu; and Akiyama, Susumu, 4,467,765, Cl. 123-419.000.

Fukuda, Mamoru. Skin closure stapling device for surgical procedures. 4,467,805, Cl. 128-334.00C.

Fukui, Masahiro: *See*—
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,468,340, Cl. 252-299.630.

Fukumitsu, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Disc reproducing apparatus. 4,468,764, Cl. 369-77.200.

Fukuyo, Sekio. Dental endosseous implants. 4,468,201, Cl. 433-176.000.

Fulgurit GmbH & Co. Kommanditgesellschaft: *See*—
Exner, Gunter; and Monkeberg, Karlheinz, 4,468,361, Cl. 264-119.000.

Fumio, Mori; Toshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, to Kuraray Co., Ltd. Method of producing gamma-halogeno-delta unsaturated carboxylic acid esters. 4,468,521, Cl. 560-124.000.

Funazo, Giichi: *See*—
Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,468,518, Cl. 548-342.000.

Funk, James E., to Alfred University Research Foundation, Inc. Process for preparing a clean coal-water slurry. 4,468,232, Cl. 44-51.000.

Furukawa, Yoshimi; and Sano, Shoichi, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular steering system. 4,467,885, Cl. 180-140.000.

Fushiki, Tatsuo, to Nippon Gakki Seizo Kabushiki Kaisha. RIAA Equalizer circuit. 4,468,627, Cl. 330-107.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Hikida, Chuichi; Yamaura, Tatsuo; and Nomura, Yuuzi, 4,468,589, Cl. 313-496.000.

Futagi, Masaaki: *See*—
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Futagi, Masaaki; and Suzuki, Tadashi, 4,467,673, Cl. 74-860.000.

G. Siempelkamp GmbH & Co.: *See*—
Gerhardt, Klaus, 4,468,188, Cl. 425-371.000.

Gabriel, Gunter: *See*—
Galow, Manfred; Flockenhaus, Claus; Meckel, Joachim; Joseph, Horst G.; and Gabriel, Gunter, 4,468,288, Cl. 201-41.000.

Gabriel, Steven A.; and Ogrinc, Michael A., to Ampex Corporation. Controller for system for spatially transforming images. 4,468,688, Cl. 358-22.000.

Gach, Peter P., to Sunbeam Plastics Corporation. Tamper indicating closure. 4,467,931, Cl. 215-237.000.

Galloup, Clifford L.; and Bula, Roger M., to Cooper Industries, Inc. Magnet wire wrapping bit. 4,467,842, Cl. 140-124.000.

Gallusser, David O.: *See*—
Frear, David L.; Punako, Stephen; MacAvoy, David W.; and Gallusser, David O., 4,468,078, Cl. 339-90.00R.

Galow, Manfred; Flockenhaus, Claus; Meckel, Joachim; Joseph, Horst G.; and Gabriel, Gunter, to Didier Engineering GmbH. Method of preheating coal and supplying preheated coal to a coke oven. 4,468,288, Cl. 201-41.000.

Galvin, Aaron A.; Guscott, John K.; Henderson, Martin E.; and Harvey, Roy L., to American District Telegraph Company. Non-home run zoning system. 4,468,664, Cl. 340-825.690.

Gambro Lundia AB: *See*—
Shaldon, Stanley; Gullberg, Claes-Ake; and Larsson, Lars-Ake, 4,468,329, Cl. 210-651.000.

Garbutt, John T., to Grain Processing Corporation. Prevention of metal tarnish. 4,468,417, Cl. 427-156.000.

Garrett Corporation, The: *See*—
Tippetts, Thomas B., 4,467,984, Cl. 244-78.000.

Gattrugeri, Giovanni. Expanding headpiece for reels in general. 4,467,977, Cl. 242-72.00B.

Gauchel, Peter; and Kurth, Josef, to Dynamit Nobel Aktiengesellschaft. Process for the vacuum calibration of profiled articles made of thermoplastic synthetic resin. 4,468,369, Cl. 264-560.000.

Gaulden, Joe L.; and Compton, Perry L. Stero speaker mixer. 4,468,806, Cl. 381-123.000.

Gaule, Ronald L. Ripper tooth means. 4,467,876, Cl. 172-870.000.

Gavens, Paul D.: *See*—
Caunt, Anthony D.; Gavens, Paul D.; and McMeeking, John, 4,468,477, Cl. 502-104.000.

Gebruder Junghans GmbH: *See*—
Kaiser, Hans; Winterhalter, Walter; Wild, Karl; and Gruner, Peter, 4,467,723, Cl. 102-240.000.

Geiger, Paul B., to Hobart Corporation. Method for a warewasher bypass soil collector. 4,468,333, Cl. 210-798.000.

Geldner, Ernst: *See*—
Friedel, Rudolf; and Geldner, Ernst, 4,468,800, Cl. 378-131.000.

Gellert, Jobst U. Hydraulically actuated injection molding system with alternate hydraulic connections. 4,468,191, Cl. 425-564.000.

Gelman Sciences Inc.: *See*—
St. John, Gerald D., 4,468,321, Cl. 210-232.000.

Genba, Yasushi; Tamaru, Shigemi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, to Mitsubishi Denki Kabushiki Kaisha. Terminal assembly for circuit interrupter. 4,468,081, Cl. 339-176.00M.

Genba, Yasushi: *See*—
Kodera, Toshihiko; Eguchi, Kiyoshi; Ishikawa, Takayoshi; Genba, Yasushi; Tamaru, Shigemi; and Satou, Susumu, 4,468,533, Cl. 200-153.0SC.
Tamaru, Shigemi; Genba, Yasushi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,082, Cl. 339-176.00M.

General Dynamics: *See*—
Hartouni, Edward; and Duda, Craig R., 4,468,117, Cl. 356-73.100.

General Electric Company: *See*—
Baker, Lewin T.; Bose, Sanjay K.; Ellis, George W.; and Puckette, Charles M., 4,468,792, Cl. 375-45.000.
Berman, Max; Klimmek, William G.; and Konrad, Charles E., 4,468,599, Cl. 318-362.000.
Bopp, Lawrence H., 4,468,461, Cl. 435-253.000.
Bradley, Irving; and Povall, Gerald W., 4,468,071, Cl. 339-50.00C.
Clark, Paul M.; Fenwick, Danny L.; and Hopkins, Jon D., 4,468,532, Cl. 200-81.90R.
Dixon, Robert C.; Poland, Ronald D.; Stoll, Bradley G.; and Okashima, Bob Y., 4,468,172, Cl. 417-151.000.
Engeler, William E.; and Mazin, Moshe, 4,468,574, Cl. 307-451.000.
Evjen, John M., 4,468,440, Cl. 429-8.000.
Hammer, Edward E.; and Beck, Charles E., 4,468,591, Cl. 313-594.000.
Holub, Fred; Floryan, Daniel E.; and White, Dwain M., 4,468,506, Cl. 525-432.000.
Kavoussi, Barry T.; and Bergholz, Eugene W., 4,468,698, Cl. 358-111.000.
King, Harold B.; Lai, Ching C.; and Walker, Edward S., 4,468,163, Cl. 414-21.000.
Klappert, Willi, 4,467,632, Cl. 72-147.000.
Main, John E., 4,468,718, Cl. 361-399.000.
Pearson, Carl E.; and Higgins, Timothy J., 4,467,610, Cl. 60-739.000.
Postlethwait, James H.; Olashaw, William F.; and Kusek, Roger, 4,468,531, Cl. 200-50.0AA.
Ringwall, Carl G., 4,468,617, Cl. 324-165.000.
Robbins, Alexander G., 4,468,774, Cl. 372-34.000.
Russell, Ronald R., 4,468,714, Cl. 361-62.000.
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General Instrument Corp.: *See*—
Teague, Randy; Silverman, Lawrence H.; and Rozario, Novellone, 4,468,644, Cl. 333-205.000.

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Carroll, Thomas J.; and Paisley, James K., 4,467,859, Cl. 165-57.000.

General Signal Corporation: *See*—
Clauss, Harry G.; and Wiese, John R., 4,468,009, Cl. 266-99.000.
McIntosh, George C.; Everdyke, Jonathan C.; and Schutte, Marlin D., 4,468,129, Cl. 366-213.000.
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Genicom Corporation: *See*—
Berrey, Harry R.; and Caulier, Paul W., 4,468,142, Cl. 400-124.000.
Harris, Samuel C., 4,468,140, Cl. 400-124.000.

Genin, Bernard C. D.: *See*—
Ulmer, Georges; and Genin, Bernard C. D., 4,468,044, Cl. 277-235.00B.

Geodynamik H. Thurner AB: *See*—
Thurner AB, Geodynamik H.; and Sandstrom, Ake, 4,467,652, Cl. 73-573.000.

George, Dennis R.; Steinmetz, Michael J.; and Weber, Robert A., to International Business Machines Corporation. Pump flow rate compensation system. 4,468,219, Cl. 604-66.000.

Gerasimov, Jury F.: *See*—
Kiseev, Valery M.; Maidanik, Jury F.; and Gerasimov, Jury F., 4,467,861, Cl. 165-104.220.

Gerber Scientific Instrument Company, The: *See*—
Pavone, Robert J., 4,468,017, Cl. 269-21.000.

Gerber Scientific Products, Inc.: *See*—
Logan, David J.; and Sullivan, Daniel J., 4,467,525, Cl. 33-18.00B.

Gerbert-Gaillard, Alain; and Morel, Robert, to Merlin Gerin. Multipole circuit breaker with removable trip unit. 4,468,645, Cl. 335-42.000.

Gerhardt, Klaus, to G. Siempelkamp GmbH & Co. Belt-type particleboard press. 4,468,188, Cl. 425-371.000.

Gerig, John S. Counting method and apparatus. 4,468,795, Cl. 377-6.000.

Gertsch, Peter, to Maschinenfabrik Wifag PR. Spiral-type ductor. 4,467,720, Cl. 101-348.000.

Gerwig, Phillip L. Hypodermic dart gun. 4,467,544, Cl. 42-1.00R.

Geschickter, Charles F., to Unimed, Inc. Treatment of arthritis. 4,468,393, Cl. 424-245.000.

Gfesser, George, Jr. Desk clock and display stand. 4,467,540, Cl. 40-152.100.

Gianzero, Stanley C.; Palaith, David E.; and Chan, David S. K., to Schlumberger Technology Corporation. Method and apparatus using pad carrying electrodes for electrically investigating a borehole. 4,468,623, Cl. 324-367.000.

Giardino, David A.: *See*—
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,467,565, Cl. 51-170.0MT.

Gibas, Christoph, to bso Steuerungstechnik GmbH. Activating magnet. 4,468,647, Cl. 335-262.000.

Gidseg, Edward. Circulating air refrigerator with removable divider shelf. 4,467,618, Cl. 62-187.000.

Gigg, Robert V.: *See*—
Birch, Stanley A.; Jackson, Sidney B.; Edmonds, Eric J. F.; Gigg, Robert V.; and Haggert, Norman L., 4,467,986, Cl. 244-147.000.

Gilchrist, H. Glen: *See*—
Davis, John B.; and Gilchrist, H. Glen, 4,468,156, Cl. 405-222.000.

Gilleo, Kenneth B.; and Kreibich, Willard H., to Northern Engraving Corporation. Boss formation using low surface energy dams. 4,468,425, Cl. 428-172.000.

Gillespie, John W.; and Haddox, Mark L., to Jodon Engineering Associates, Inc. Ignition timing control for internal combustion engines. 4,467,763, Cl. 123-414.000.

Gillman, Dale C., to CRI Engineering, Inc. Electrode assembly for melting glass. 4,468,779, Cl. 373-36.000.

Gimmestad, Beverly; and Brumm, Douglas. Classroom demonstration calculator. 4,468,203, Cl. 434-228.000.

Ginsburg, Milton, to Ginsey Industries, Inc. Hinge for toilet seat. 4,467,481, Cl. 4-240.000.

Ginsey Industries, Inc.: *See*—
Ginsburg, Milton, 4,467,481, Cl. 4-240.000.

Girguis, Sobhy L. Overload clutch. 4,467,902, Cl. 192-56.00R.

Givens, Wyatt W., to Mobil Oil Corporation. Method for identifying complex lithologies in a subsurface formation. 4,467,642, Cl. 73-152.000.

GK Technologies, Inc.: *See*—
Brorein, William J., 4,468,089, Cl. 350-96.230.

Glanfield Lawrence (Concessions) Ltd.: *See*—
Vaizey, Geoffrey S., 4,468,018, Cl. 269-54.500.

Glang, Reinhard; Ku, San-Mei; and Schmitt, Alfred, to International Business Machines Corporation. Process for fabricating polycrystalline silicon film resistors. 4,467,519, Cl. 29-576.00B.

Gleinig, Harald: *See*—
Linhart, Karl; Gleinig, Harald; Boehmke, Gunther; and Breig, Kurt, 4,468,349, Cl. 260-205.000.

Global Marine, Inc.: *See*—
Horton, Edward E., 4,468,157, Cl. 405-224.000.

Globe Machine Manufacturing Company: *See*—
Yock, Lewis M.; and Burdick, Jack B., 4,468,325, Cl. 210-408.000.

Gneiding, Donald R., to Dual Fuel Systems, Inc. Fluid regulator. 4,467,828, Cl. 137-484.400.

Godfrey, H. Glenn. Connector for display systems. 4,467,854, Cl. 160-135.000.

Godfrey, Jack F.; and Grant, Charles L., to Standard Oil Company. On-line reclaim system. 4,467,969, Cl. 241-101.00B.

Goepp, Robert A.; and Freese, Uwe E., to University Patents, Inc. Custom valved cervical cap. 4,467,789, Cl. 128-1.00R.

Gogic, Aleksandar M.: *See*—
Peters, Rex B.; Malametz, Arnold; Tonn, Jeffrey F.; Lee, Charles K.; Gogic, Aleksandar M.; and Corey, Victor B., 4,467,651, Cl. 73-497.000.

Goi, Koichi: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,468,068, Cl. 312-333.000.

Gold, Bryant R.: *See*—
North, Larry; and Gold, Bryant R., 4,467,527, Cl. 33-366.000.

Gold, Elijah H.; Kaminski, James J.; and Puchalski, Chester, to Schering Corporation. Antiulcer tricyclic imidazo [1,2-a]pyridines. 4,468,400, Cl. 424-256.000.

Goldberg, Selwyn B., to RCA Corporation. Amplitude control apparatus. 4,468,631, Cl. 330-284.000.

Goldenberg, David M.: *See*—
Goldenberg, Milton D.; and Shochat, Dan, 4,468,457, Cl. 435-69.000.

Goldenberg, Milton D.; and Shochat, Dan, to Goldenberg, David M. Method for producing a CSAp tryptic peptide and anti-CSAp antibodies. 4,468,457, Cl. 435-69.000.

Golder Associates Ltd.: *See*—
Davis, John B.; and Gilchrist, H. Glen, 4,468,156, Cl. 405-222.000.

Golykh, Vladimir T., deceased: *See*—
Kreinin, Efim V.; Smolkov, Anatoly N.; Iliin, Valentin A.; and Golykh, Vladimir T., deceased, 4,467,779, Cl. 126-91.00A.

Gordon Barlow Design: *See*—
Barlow, Gordon A.; and Krutsch, John R., 4,468,031, Cl. 273-110.000.

Gordon, Herman B., to Rogers Corporation. Solderless connection technique and apparatus. 4,468,074, Cl. 339-75.00N.

Goto, Jiro: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,468,515, Cl. 548-128.000.

Goto, Yasuyuki: *See*—
Inoue, Hironichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,468,340, Cl. 252-299.630.

Gott, Hans; Scherr, Rudolf; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwicklungs-und Verwertungs-Gesellschaft mbH. Multispotwelding machine for the production of grids or gratings. 4,468,550, Cl. 219-56.000.

Gottlieb, A. Arthur, to Endeavor Corp. Leukocyte extracts for affecting the immune system. 4,468,379, Cl. 424-101.000.

Gottlieb, Klaus: *See*—
Bruderreck, Hartmut; Deininger, Gunter; Gottlieb, Klaus; Wehmeier, Friedel-Heinrich; and Haselhorst, Manfred, 4,468,233, Cl. 44-56.000.

Gotze, Volkmar; and Potz, Gunther, to International Business Machines Corporation. Highly integrated programmable logic array utilizing AND and OR arrays. 4,468,735, Cl. 364-200.000.

Gould, Gordon: *See*—
Schmadel, Donald; Culver, William H.; and Gould, Gordon, 4,468,091, Cl. 350-96.300.

Gould Inc.: *See*—
Harris, Robert W., 4,468,785, Cl. 375-4.000.

Gourdenne, Albert; and Heintz, Pascal, to Electricite de France (Service National). Method of preparing polymer lattices of homogeneous interpenetrated structure. 4,468,485, Cl. 523-137.000.

Gousseau, Roland R.: *See*—
Milan, Lucien R.; and Gousseau, Roland R., 4,468,087, Cl. 350-96.180.

Gozzo, Franco: *See*—
Colle, Roberto; Gozzo, Franco; and Preziuso, Ciro, 4,468,243, Cl. 71-88.000.

Grabowski, John S.; and Tong, Aaron C. Y., to NCR Corporation. Multiple font OCR reader. 4,468,809, Cl. 382-50.000.

Graham, Johnny R.; and Graham, Kenneth Z., to Cantrell Machine Co., Inc. Rotary viscera harvester. 4,467,498, Cl. 17-45.000.

Graham, Kenneth Z.: *See*—
Graham, Johnny R.; and Graham, Kenneth Z., 4,467,498, Cl. 17-45.000.

Grain Processing Corporation: *See*—
Garbutt, John T., 4,468,417, Cl. 427-156.000.

Gramss, Jurgen: *See*—
Eichhorn, Hans-Gunther; and Gramss, Jurgen, 4,468,566, Cl. 250-492.200.

Grant, Charles L.: *See*—
Godfrey, Jack F.; and Grant, Charles L., 4,467,969, Cl. 241-101.00B.

Grant, Louis R.: *See*—
Artz, Glen D.; and Grant, Louis R., 4,468,263, Cl. 149-22.000.

Green, Jonathan B.; and Kino, Gordon S., to United States of America, Navy. Monolithic combined charge transfer and surface acoustic wave device. 4,468,639, Cl. 333-153.000.

Green, Milton J., to Woodstream Corporation. Method and apparatus for fabricating fishing rods. 4,468,270, Cl. 156-189.000.

Greenland, Harry; and Hodgetts, Edward S., to Colgate-Palmolive Company. Visually clear dentifrice. 4,467,921, Cl. 206-524.400.

Greenstein, Bernard, to RCA Corporation. Method and apparatus for quantitatively evaluating the soldering properties of a wave soldering system. 4,467,638, Cl. 73-64.400.

Gregg, John D. W., to Wheel Developments Limited. Heavy duty polymeric spring member and combination of spring and castor construction. 4,467,496, Cl. 16-18.00B.

Gregory, John R.; Parks, Gerald; and Dondero, John D. Upper body protector apparatus. 4,467,475, Cl. 2-2.000.

Griffin, Arnold F.; and Costello, Michael C., to Norcim Investments Pty Ltd. Metal recovery. 4,468,303, Cl. 204-109.000.

Grifford, Daniel W. Combination chuck key tool. 4,467,677, Cl. 81-439.000.

Grigoleit Company, The: *See*—
Howie, Robert K., Jr., 4,467,515, Cl. 29-527.200.

Gritton, Charles W. K., to AT&T Bell Laboratories. Adaptive filter update normalization. 4,468,640, Cl. 333-166.000.

Gritton, Charles W. K.: *See*—
Duttweiler, Donald L.; Gritton, Charles W. K.; and Tao, Ying G., 4,468,641, Cl. 333-166.000.

Gromen, William E., to United States of America as represented by the Director of the National Security Agency, The. Method for serial transmission and receipt of binary information. 4,468,789, Cl. 375-25.000.

Groshans, Joseph R.: *See*—
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,467,565, Cl. 51-170.0MT.

Gross, Winthrop A., to Tektronix, Inc. Differential amplifier with high common-mode rejection. 4,468,628, Cl. 330-258.000.

Grosshauser, Heinrich K., to Koenig & Bauer Aktiengesellschaft. Web-fed offset rotary printing machine. 4,467,719, Cl. 101-221.000.

Grosvenor, Ronald L., to IMI Marston Limited. Flexible container. 4,468,812, Cl. 383-108.000.

Grundler, Bruno, to SIG Schweizerische Industrie-Gesellschaft. Method and apparatus for shaping a rectangular carton blank. 4,468,214, Cl. 493-310.000.

Gruner, Peter: *See*—
Kaiser, Hans; Winterhalter, Walter; Wild, Karl; and Gruner, Peter, 4,467,723, Cl. 102-240.000.

GTE Automatic Electric Inc.: *See*—
Bowen, Ted R., 4,468,737, Cl. 364-200.000.
Cripps, Peter K., 4,468,538, Cl. 179-2.0EA.
Cripps, Peter K., 4,468,540, Cl. 179-2.0EA.
Schober, Edward A., 4,468,539, Cl. 179-2.0EA.

GTE Laboratories Incorporated: *See*—
Cogan, Adrian I., 4,468,682, Cl. 357-22.000.

GTE Network Systems Incorporated: *See*—
Kapral, Christopher W., 4,468,653, Cl. 340-347.0DA.
Kapral, Christopher W., 4,468,654, Cl. 340-347.0DA.

GTE Products Corporation: *See*—
Beyland, Laurens S.; and Warren, Bernard J., 4,468,585, Cl. 313-318.000.

Guay, George W.: *See*—
Cabrera, Rene J.; Guay, George W.; and Bookwalter, John R., 4,467,791, Cl. 128-20.000.

Guglielmo, Alfred R.; and Coast, John B., to Guglielmo, Alfred R. Apparatus for centrifugally extracting crabmeat from crabs. 4,467,501, Cl. 17-71.000.

Gullberg, Claes-Ake: *See*—
Shaldon, Stanley; Gullberg, Claes-Ake; and Larsson, Lars-Ake, 4,468,329, Cl. 210-651.000.

Gunter, Erwin J.: *See*—
Bloch, Peter; Wydler, Robert; and Gunter, Erwin J., 4,467,568, Cl. 51-287.000.

Gupta, Arunava; and Yardley, James T., to Allied Corporation. Iron/-silicon-based catalyst exhibiting high selectivity to C_2–C_6 alkenes in CO/H_2 Fischer-Tropsch reactions. 4,468,474, Cl. 502-5.000.

Gupta, Surendra P., to Standard Oil Company. Method to reduce sulfonate loss in micellar flooding. 4,467,869, Cl. 166-273.000.

Gurries, Raymond A., to Resonant Technology Company. Resonance aided front end loader. 4,467,539, Cl. 37-118.00R.

Guscott, John K.: *See*—
Galvin, Aaron A.; Guscott, John K.; Henderson, Martin E.; and Harvey, Roy L., 4,468,664, Cl. 340-825.690.

Gutierrez Atencio, Francisco J. Symmetric tidal station. 4,468,153, Cl. 405-78.000.

H. H. Robertson Company: *See*—
Hague, James G., 4,467,582, Cl. 52-478.000.

Haagen, Darl E.; and Eyre, David L., to Kuhlman Corporation. Locking fuel cap. 4,468,058, Cl. 292-144.000.

Haddox, Mark L.: *See*—
Gillespie, John W.; and Haddox, Mark L., 4,467,763, Cl. 123-414.000.

Haegeman, Johny H. Apparatus for mixing air and liquid. 4,468,358, Cl. 261-91.000.

Haettinger, George C.: *See*—
Beckman, John H.; Haettinger, George C.; and Kupcikevicius, Vytautas, 4,467,499, Cl. 17-49.000.

Hafele, Robert X., to Hoover Universal, Inc. Method for transporting sectional molds. 4,468,368, Cl. 264-530.000.

Haferl, Peter E., to RCA Corporation. Horizontal drive and nonlinearity correction circuit. 4,468,593, Cl. 315-371.000.

Hageman, James R.: *See*—
Platt, Clark I.; and Hageman, James R., 4,467,627, Cl. 68-17.00R.

Hager, Walter; and Petry, Kurt, to Pfaff Industriemaschinen GmbH. Seamed material edge guide for a sewing machine. 4,467,739, Cl. 112-153.000.

Haggert, Norman L.: *See*—
Birch, Stanley A.; Jackson, Sidney B.; Edmonds, Eric J. F.; Gigg, Robert V.; and Haggert, Norman L., 4,467,986, Cl. 244-147.000.

Hague, James G., to H. H. Robertson Company. Joint retention clip for rib-like panel joint. 4,467,582, Cl. 52-478.000.

Hahn, Richard A., to Eli Lilly and Company. Method of blocking peripheral norepinephrine release. 4,468,401, Cl. 424-258.000.

Haldimann, Hans R., to Tortuga S.A. Continuous shelf storage system utilizing the gravity feed principle. 4,467,725, Cl. 104-162.000.

Hale, Donnie E.: *See*—
McMahon, Ronald G.; and Hale, Donnie E., 4,468,144, Cl. 400-354.000.

Halicho, James J., to Timex Corporation. Watch bezel/lens/rocker switch assembly. 4,468,134, Cl. 368-309.000.

Hall, Arlie. Insulating cell element and structures composed thereof. 4,468,423, Cl. 428-72.000.

Hall, Charles P., to Monterey Manufacturing Co. Waterbed mattress with free floating baffle. 4,467,485, Cl. 5-450.000.

Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Futagi, Masaaki; and Suzuki, Tadashi, to Nissan Motor Company, Limited. Control system for engine of automotive vehicle equipped with lock-up type automatic transmission. 4,467,673, Cl. 74-860.000.

Hamanishi, Yoshinari, to Nippon Kogaku K.K. Four-group telephoto zoom lens. 4,468,096, Cl. 350-427.000.

Hamanishi, Yoshinari, to Nippon Kogaku K.K. Four-group great aperture ratio zoom lens. 4,468,097, Cl. 350-427.000.

Hamar, Martin R. Penta-prism module having laser alignment error detection and correction capability. 4,468,119, Cl. 356-152.000.

Hamilton, James M.: *See—*
Woods, Lonnie K.; and Hamilton, James M., 4,468,050, Cl. 280-707.000.
Woods, Lonnie K.; and Hamilton, James M., 4,468,739, Cl. 364-424.000.

Hamley, Adrian H.: *See—*
Berryman, Walter H.; Manson, Peter J.; Hamley, Adrian H.; and Korb, Joseph, 4,467,646, Cl. 73-304.00C.

Hammann, Ingeborg: *See—*
Schmetzer, Johannes; Stetter, Jorg; Hammann, Ingeborg; and Homeyer, Bernhard, 4,468,397, Cl. 424-248.510.

Hammer, Edward E.; and Beck, Charles E., to General Electric Company. Shaped discharge lamp with starting aid and starting strip. 4,468,591, Cl. 313-594.000.

Hanada, Minoru; Tsunakawa, Mitsuaki; Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, to Bristol-Myers Company. 1-Deamino-1-hydroxy-aminoglycoside compounds, antibacterial compositions and method of use. 4,468,386, Cl. 424-181.000.

Hance, Michael E.: *See—*
Warren, Toney C.; and Hance, Michael E., 4,468,767, Cl. 370-55.000.

Handrus, Jonathan D., to Davidson, Mark C. Apparatus and method for raising lobsters. 4,467,744, Cl. 119-2.000.

Hansen, Stanley W.; Terleski, John D.; and Whaley, Mark D., to Ford Aerospace & Communications Corporation. Bus access arbitration using unitary arithmetic resolution logic and unique logical addresses of competing processors. 4,468,738, Cl. 364-200.000.

Hansen, Warren T.: *See—*
Fesmire, Robert H.; and Hansen, Warren T., 4,467,530, Cl. 34-8.000.

Hanset, Richard E., to Beta Technology, Inc. Low level indicator. 4,468,170, Cl. 417-44.000.

Hanson, Colin J., to Penril Corp. Radio frequency apparatus for measuring moisture content of materials as a function of dielectric constant. 4,468,610, Cl. 324-61.00R.

Hara, Hideyuki: *See—*
Oka, Toshihisa; Nakanishi, Hiroaki; Takamatsu, Ryoichi; Morioka, Takayuki; Okada, Masakazu; Hara, Hideyuki; and Kasashima, Hirokazu, 4,468,733, Cl. 364-200.000.

Hara, Kohzo: *See—*
Hiroshima, Minoru; Hara, Kohzo; Suzuki, Ryo; and Takeshita, Masatoshi, 4,468,758, Cl. 365-15.000.

Harada, Shunichi: *See—*
Ban, Tenji; Mochizuki, Kazuo; Sakamoto, Yasuhei; and Harada, Shunichi, 4,468,292, Cl. 204-27.000.

Hardison, Dorothy A. Laundry drier dividers. 4,467,535, Cl. 34-109.000.

Hardy, Thomas G.; Kaganov, Alan L.; and Pace, W. G., to American Cyanamid Company, a part interest. Anastomotic device. 4,467,804, Cl. 128-334.00C.

Hardymon, Mark. Well packer provided with dual methods of use. 4,467,865, Cl. 166-102.000.

Hargraves, David P.: *See—*
Behr, Joseph L.; and Hargraves, David P., 4,467,613, Cl. 62-115.000.

Harich, Jakob: *See—*
Seifert, Reuben E., deceased; and Harich, Jakob, 4,468,372, Cl. 422-124.000.

Harms, Margret; Luthje, Holger; and Matthiessen, Bernd, to U.S. Philips Corporation. Radiation lithography mask and method of manufacturing same. 4,468,799, Cl. 378-35.000.

Harrington, Eugene M. Trowel type construction tool. 4,467,492, Cl. 15-235.400.

Harris Corporation: *See—*
Davis, Robert C., 4,468,786, Cl. 375-11.000.
Swanson, Hilmer I., 4,468,626, Cl. 330-10.000.
Van Vonno, N. W., 4,468,414, Cl. 427-53.100.

Harris, Donald L., to Cordis Corporation. Small diameter lead with introducing assembly. 4,467,817, Cl. 128-786.000.

Harris, Robert W., to Gould Inc. Telemetry system with signal booster for digital data transmission through a transmission line. 4,468,785, Cl. 375-4.000.

Harris, Samuel C., to Genicom Corporation. Method and apparatus for coordinated control of dot matrix printer head and carriage. 4,468,140, Cl. 400-124.000.

Harsco Corporation: *See—*
Downey, Robert C., Jr., 4,467,853, Cl. 160-133.000.

Harshaw/Filtrol Partnership: *See—*
Little, Frank, 4,467,940, Cl. 220-345.000.

Harte, Richard A.: *See—*
Chen, Anthony B.; Harte, Richard A.; and Kaufman, Nancy K., 4,468,371, Cl. 422-102.000.

Hartkamp, Hans G.: *See—*
Johne, Frank; Hartkamp, Hans G.; and Burmester, Hans-Georg, 4,467,679, Cl. 82-36.00R.

Hartouni, Edward; and Duda, Craig R., to General Dynamics. Integrated optical fiber testing device. 4,468,117, Cl. 356-73.100.

Hartshorn, Frank, to USM Corporation. Shoe upper conforming machine. 4,467,487, Cl. 12-8.300.

Haruta, Kazumi: *See—*
Isogai, Kiyoshi; Koga, Ituo; Yamada, Yutaka; and Haruta, Kazumi, 4,467,750, Cl. 123-188.00M.

Harvey, Roy L.: *See—*
Galvin, Aaron A.; Guscott, John K.; Henderson, Martin E.; and Harvey, Roy L., 4,468,664, Cl. 340-825.690.

Hasak, Wilhelm, to Landshuter Baueisenbiegerei GMBH. Reinforcement basket for reinforced-concrete column. 4,467,583, Cl. 52-653.000.

Hasegawa, Shumpei, to Honda Motor Co., Ltd. Engine RPM control method for internal combustion engines. 4,467,761, Cl. 123-339.000.

Haselhorst, Manfred: *See—*
Bruderreck, Hartmut; Deininger, Gunter; Gottlieb, Klaus; Wehmeier, Friedel-Heinrich; and Haselhorst, Manfred, 4,468,233, Cl. 44-56.000.

Hashimoto, Yoshitaka; Yamamoto, Kaichi; and Shirota, Norihisa, to Sony Corporation. Digital video recorder. 4,468,710, Cl. 360-9.100.

Haskel, Incorporated: *See—*
Kelly, John W., 4,467,630, Cl. 72-62.000.

Hatchadoorian, Edward; Ostapchenko, George J.; and Young, Harlan S., to Du Pont de Nemours, E. I., and Company. Adherable reinforced poly(ethylene terephthalate) composite sheet. 4,468,426, Cl. 428-213.000.

Hattori, Kenji; Aoki, Kongou; and Hayashi, Masaharu, to Aisin Seiki Kabushiki Kaisha. Temperature responsive, pneumatically actuated, fluid shear, cooling fan clutch and a control providing three step variation thereof. 4,467,901, Cl. 192-52.000.

Hattori, Kenji: *See—*
Hayashi, Masaharu; Nakagawa, Makoto; and Hattori, Kenji, 4,467,903, Cl. 192-58.00B.

Hattori, Shigesori, to Brother Kogyo Kabushiki Kaisha. Printing apparatus with a thermal print head including ribbon cartridge. 4,468,139, Cl. 400-120.000.

Haulk, Elvro L. Fishing lure. 4,467,550, Cl. 43-42.530.

Hausselt, Jurgen; Schiwiora, Harry; Stumke, Manfred; and Lutz, Klaus, to Degussa Aktiengesellschaft. Gold containing preparation for coating metallic parts (II). 4,468,251, Cl. 106-1.180.

Haustein, Manfred, to VEB Werkzeugmaschinenbau. Arrangement of a measurement controlling device in circular grinding machines. 4,467,564, Cl. 51-165.00R.

Hawn, Richard D., Jr.: *See—*
Burge, Edward V., 4,467,879, Cl. 175-325.000.

Hayakawa, Yoshikazu: *See—*
Hayashi, Yoshimasa; Hayakawa, Yoshikazu; and Ogawa, Naoki, 4,467,754, Cl. 123-195.00H.

Hayashi, Keiichiro. Carrier tube for prints, sheets or artistic canvases. 4,467,917, Cl. 206-412.000.

Hayashi, Keiji: *See—*
Nagatake, Hiroshi; and Hayashi, Keiji, 4,467,484, Cl. 5-449.000.

Hayashi, Masaharu; Nakagawa, Makoto; and Hattori, Kenji, to Aisin Seiki Kabushiki Kaisha. Temperature responsive, pneumatically actuated, fluid shear, cooling fan clutch and control therefor. 4,467,903, Cl. 192-58.00B.

Hayashi, Masaharu: *See—*
Hattori, Kenji; Aoki, Kongou; and Hayashi, Masaharu, 4,467,901, Cl. 192-52.000.

Hayashi, Shigeki: *See—*
Matsui, Sigeo; Tukahara, Yogo; Hayashi, Shigeki; and Kumagai, Masahiko, 4,468,238, Cl. 55-26.000.

Hayashi, Yoshimasa; Hayakawa, Yoshikazu; and Ogawa, Naoki, to Nissan Motor Company, Limited. Automotive internal combustion engine. 4,467,754, Cl. 123-195.00H.

Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Internal combustion engine with bearing beam structure. 4,467,755, Cl. 123-195.00H.

Hayes, Edward J.: *See—*
Sisson, Albert E.; and Hayes, Edward J., 4,467,963, Cl. 239-90.000.

Heaton, John L.: *See—*
Spooner, Frank H.; Snider, Charles R.; and Heaton, John L., 4,467,521, Cl. 29-576.00E.

Heavey, Frederick D.; and Kaldun, Mark R., to SAFT America, Inc. Standby power system. 4,468,571, Cl. 307-66.000.

Hedden, Jerry C.; and Allen, Lesley M., to PPG Industries, Inc. Tubular glass fiber package and method. 4,467,916, Cl. 206-410.000.

Hedlund Manufacturing Co., Inc.: *See—*
Martin, Mervin G., 4,467,967, Cl. 239-662.000.

Hehl, Karl. Proximity switch assembly with multiple interchangeable switch cores. 4,468,573, Cl. 307-113.000.

Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,467,820, Cl. 131-276.000.

Heintz, Pascal: *See—*
Gourdenne, Albert; and Heintz, Pascal, 4,468,485, Cl. 523-137.000.

Held, Kurt. Press band arrangement for double-band presses. 4,467,718, Cl. 100-151.000.

Heldens, Ludovicus G. M.: *See—*
Esser, Leonard J. M.; and Heldens, Ludovicus G. M., 4,468,684, Cl. 357-24.000.

Hemmerling, Gene A., to American Metal Door Company, Inc. Fire door assembly. 4,467,562, Cl. 49-411.000.

Henderson, Martin E.: *See—*
Galvin, Aaron A.; Guscott, John K.; Henderson, Martin E.; and Harvey, Roy L., 4,468,664, Cl. 340-825.690.

Henhapl, Albert: *See—*
Schnell, William J.; Fowles, Thomas A.; and Henhapl, Albert, 4,467,930, Cl. 215-32.000.

Henke, Arthur W.: *See*—
Hines, Gordon E.; Anderson, Ronald W.; and Henke, Arthur W., 4,467,650, Cl. 73-483.000.

Henry Filters, Inc.: *See*—
McEwen, Stephen N.; Stevens, Robert L.; Benschoter, Barry R.; and Benschoter, Robert F., 4,467,633, Cl. 72-203.000.

Hensbo, Lars C. Parallel ruler. 4,467,528, Cl. 33-444.000.

Hensel, Paul C.; and Hooper, Raymond C., to British Telecommunications. Electronic telephone exchanges and optical fiber links for use therein. 4,468,765, Cl. 370-1.000.

Herbert, M. Linton. Bullet-proof garment. 4,467,476, Cl. 2-2.500.

Herbstler, Horst D.: *See*—
Terziax, Rouben T.; Herbstler, Horst D.; and Wozniak, Walter J., 4,467,555, Cl. 446-158.000.

Herchenbach, Paul; and Konrad, Mathias, to Jean Walterscheid GmbH. Torque-limiting clutch. 4,468,206, Cl. 464-37.000.

Hewlett-Packard Company: *See*—
Hughes, William L., 4,468,723, Cl. 363-82.000.
Leavitt, Steven C.; Larsen, Hugh G.; and Hunt, Barry F., 4,468,747, Cl. 364-577.000.
Neukermans, Armand P., 4,468,282, Cl. 156-633.000.

Hickling, Richard C., to HiRiser Limited. Work platform for buildings. 4,467,888, Cl. 182-19.000.

Higgins, Timothy J.: *See*—
Pearson, Carl E.; and Higgins, Timothy J., 4,467,610, Cl. 60-739.000.

Higratherm Electric GmbH: *See*—
Dahlberg, Reinhard, 4,468,683, Cl. 357-23.000.

Hikida, Chuichi; Yamaura, Tatsuo; and Nomura, Yuuzi, to Futaba Denshi Kogyo Kabushiki Kaisha. Low speed electron excited fluorescent material and fluorescent display tube. 4,468,589, Cl. 313-496.000.

Hikita, Mitsutaka, to Hitachi, Ltd. Band pass filter device. 4,468,642, Cl. 333-193.000.

Hilkenmeier, Jurgen: *See*—
Volke, Hans-Werner; Hilkenmeier, Jurgen; Kohlhage, Hermann; and Tewes, Udo, 4,468,143, Cl. 400-248.000.

Hill, Christopher P. R., to Rolls-Royce Limited. Electro chemical machining methods. 4,468,304, Cl. 204-129.600.

Hill, Eugene F. Hydrogen separation using coated titanium alloys. 4,468,235, Cl. 55-16.000.

Hillis, Maurice R., to Electricity Council, The. Method for the electrolytic regeneration of etchants for metals. 4,468,305, Cl. 204-130.000.

Hilsum, Cyril; and McDonnell, Damien G., to National Research Development Corporation. Temperature indicating devices. 4,468,137, Cl. 374-160.000.

Hine, Jean P.; and McGaffigan, Thomas H., to Raychem Corporation. Array package connector and connector tool. 4,468,076, Cl. 339-75.00M.

Hines, Gordon E.; Anderson, Ronald W.; and Henke, Arthur W., to Hines Industries, Inc. Hard static balancing machine. 4,467,650, Cl. 73-483.000.

Hines Industries, Inc.: *See*—
Hines, Gordon E.; Anderson, Ronald W.; and Henke, Arthur W., 4,467,650, Cl. 73-483.000.

Hinger, Klaus-Jurgen, to Werner & Pfleiderer. Process for the hydrolysis of cellulose from vegetable raw materials to glucose and apparatus for performing the process. 4,468,256, Cl. 127-1.000.

Hiniker Company: *See*—
Hodapp, Gary D., 4,467,872, Cl. 172-126.000.

Hinshaw, Waldo S., to National Research Development Corporation. Investigation of samples by N.M.R. techniques. 4,468,621, Cl. 324-309.000.

Hiraga, Masaharu; Mabe, Atsushi; and Yoshii, Yuji, to Sanden Corporation. Scroll type compressor with displacement adjusting mechanism. 4,468,178, Cl. 417-440.000.

Hirai, Masanori: *See*—
Muramatsu, Kozo; Hirai, Masanori; Sugihara, Saburo; and Nakamura, Hirozumi, 4,468,289, Cl. 204-1.00T.

Hirakawa, Osamu: *See*—
Tamura, Masayoshi; Kinoshita, Ryohei; Matsubayashi, Norio; Matsumoto, Mitsuharu; Sukeda, Toshiaki; and Hirakawa, Osamu, 4,468,075, Cl. 339-75.00M.

Hiramoto, Tatsumi, to Ushio Denki Kabushiki Kaisha. Method for diffusing dopant atoms. 4,468,260, Cl. 148-1.500.

Hirata, Hitoshi: *See*—
Numata, Tatsuo; Nishioka, Akira; and Hirata, Hitoshi, 4,468,537, Cl. 381-15.000.

Hirata, Yasushi: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,468,496, Cl. 525-233.000.

Hiratani, Hajime; Uchida, Naomi; and Nishimura, Toyohiko, to Japan Chemical Research Co., Ltd. Method of fractional collection of gastric acid secretion inhibiting components. 4,468,344, Cl. 260-112.00R.

Hirayama, Kazuhiro: *See*—
Suzuki, Akio; and Hirayama, Kazuhiro, 4,468,112, Cl. 355-14.00D.

HiRiser Limited: *See*—
Hickling, Richard C., 4,467,888, Cl. 182-19.000.

Hirose, Yoshikazu: *See*—
Kataoka, Yushin; Matsuda, Masaki; Yoshitake, Hiroshi; and Hirose, Yoshikazu, 4,468,374, Cl. 423-112.000.

Hiroshima, Minoru; Hara, Kohzo; Suzuki, Ryo; and Takeshita, Masatoshi, to Hitachi, Ltd. Magnetic bubble memory chip. 4,468,758, Cl. 365-15.000.

Hirota, Yukitsugu: *See*—
Sone, Masazumi; Hirota, Yukitsugu; Miyashita, Takao; and Igawa, Tatsuo, 4,468,543, Cl. 200-19.0DR.

Hiroyuki Kanai: *See*—
Mitsuyoshi, Toru; and Uchida, Yasuyuki, 4,467,505, Cl. 26-33.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Narukawa, Yasunori; and Iwabuchi, Mitsunobu, 4,468,630, Cl. 330-267.000.

Hitachi, Ltd.: *See*—
Atago, Takeshi; and Manaka, Toshio, 4,467,771, Cl. 123-490.000.
Hikita, Mitsutaka, 4,468,642, Cl. 333-193.000.
Hiroshima, Minoru; Hara, Kohzo; Suzuki, Ryo; and Takeshita, Masatoshi, 4,468,758, Cl. 365-15.000.
Koizumi, Hideaki; and Oishi, Konosuke, 4,468,121, Cl. 356-328.000.
Kubozoe, Morioki; Satow, Hisasi; and Johnson, John E., Jr., 4,468,560, Cl. 250-311.000.
Mori, Kenji, 4,468,583, Cl. 310-328.000.
Ogiwara, Kenzyu; and Osanai, Tooru, 4,468,167, Cl. 415-1.000.
Oka, Toshihisa; Nakanishi, Hiroaki; Takamatsu, Ryoichi; Morioka, Takayuki; Okada, Masakazu; Hara, Hideyuki; and Kasashima, Hirokazu, 4,468,733, Cl. 364-200.000.
Omae, Tsutomu; Matsuda, Toshihiko; and Tachikawa, Makoto, 4,468,724, Cl. 363-88.000.
Sasaki, Susumu; and Shizuka, Masayuki, 4,468,580, Cl. 310-237.000.
Sasaki, Tamotsu; Takagaki, Tetsuya; and Ikeda, Kenichi, 4,468,195, Cl. 432-36.000.
Sone, Masazumi; Hirota, Yukitsugu; Miyashita, Takao; and Igawa, Tatsuo, 4,468,543, Cl. 200-19.0DR.
Tada, Naofumi, 4,468,646, Cl. 335-216.000.
Takahashi, Kengo, 4,468,570, Cl. 290-52.000.
Takemori, Satoshi; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,468,777, Cl. 372-107.000.

Hitco: *See*—
Street, Sidney W.; and Beckley, Don A., 4,468,497, Cl. 525-422.000.

Hobart Corporation: *See*—
Geiger, Paul B., 4,468,333, Cl. 210-798.000.

Hobson, Lloyd L. Folding fork lift with a multiple telescoping top lift attachment. 4,467,893, Cl. 187-9.00R.

Hocker, G. Benjamin; and Skogen, John D., to Honeywell Inc. Acoustic desensitization of optical fibers by means of nickel jackets. 4,468,294, Cl. 204-27.000.

Hockman, Mark E. Splitting device. 4,467,851, Cl. 145-2.00R.

Hodapp, Gary D., to Hiniker Company. Telescoping row marker. 4,467,872, Cl. 172-126.000.

Hodgetts, Edward S.: *See*—
Greenland, Harry; and Hodgetts, Edward S., 4 467,921, Cl. 206-524.400.

Hoechst Aktiengesellschaft: *See*—
Krause, Werner; and Pieper, Werner, 4,468,355, Cl. 260-502.40R.
Pliefke, Engelbert, 4,468,295, Cl. 204-33.000.

Hofelt, Martijn H. H., to U.S. Philips Corporation. System for the quantization of signals. 4,468,790, Cl. 375-30.000.

Hogberg, Goran: *See*—
Holmqvist, Richard; Berglund, Erling; and Hogberg, Goran, 4,467,843, Cl. 141-1.000.

Hoguet, Robert G.: *See*—
Thomas, Thomas J.; Hoguet, Robert G.; Sandefur, Charles W.; and Kalz, Dietmar, 4,468,230, Cl. 8-528.000.

Hohn, Fritz-Jurgen, to International Business Machines Corporation. Shaped electron emission from single crystal lanthanum hexaboride with intensity distribution. 4,468,586, Cl. 313-336.000.

Hollister Incorporated: *See*—
Jensen, Marvin E., 4,468,227, Cl. 604-327.000.

Holm, Reimer: *See*—
Benninghoven, Alfred; Kampf, Gunther; and Holm, Reimer, 4,468,468, Cl. 436-173.000.

Holmes, Jerry D.: *See*—
Johnson, Charles R.; Ward, Phillip W.; Lindley, Joe H.; Maher, Robert A.; Holmes, Jerry D.; and Fuchser, Troy D., 4,468,793, Cl. 375-97.000.

Holmqvist, Richard; Berglund, Erling; and Hogberg, Goran, to Clinicon AB. Method of operating a metering apparatus for liquid. 4,467,843, Cl. 141-1.000.

Holub, Fred; Floryan, Daniel E.; and White, Dwain M., to General Electric Company. Polyetherimide blends. 4,468,506, Cl. 525-432.000.

Homann, Thorsten: *See*—
Knuth, Manfred; and Homann, Thorsten, 4,467,713, Cl. 100-37.000.

Homeyer, Bernhard: *See*—
Schmetzer, Johannes; Stetter, Jorg; Hammann, Ingeborg; and Homeyer, Bernhard, 4,468,397, Cl. 424-248.510.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Asaka, Urataro; Kurata, Noboru; and Masumura, Masanori, 4,467,751, Cl. 123-190.00E.
Furukawa, Yoshimi; and Sano, Shoichi, 4,467,885, Cl. 180-140.000.
Okada, Yasushi; Takahashi, Fumitaka; and Tagami, Katsutoshi, 4,468,581, Cl. 310-316.000.

Honda, Hisao: *See*—
Kawahara, Hideo; Nagayama, Hirotsugu; and Honda, Hisao, 4,468,420, Cl. 427-397.700.

Honda Motor Co., Ltd.: *See*—
Hasegawa, Shumpei, 4,467,761, Cl. 123-339.000.

Honeywell Inc.: *See*—
Brausling, Russell D.; and Kurschner, Dennis L., 4,468,763, Cl. 367-136.000.

Carrison, Craig L.; Joseph, James D.; and Narendra, Patrenahalli M., 4,468,727, Cl. 364-200.000.
Hocker, G. Benjamin; and Skogen, John D., 4,468,294, Cl. 204-27.000.
Hutcheson, Lynn D.; and Tamura, Poohsan N., 4,468,084, Cl. 350-96.110.
Jaeger, Thomas S., 4,468,192, Cl. 431-20.000.
Honeywell Information Systems Inc.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Salas, Edward R., 4,468,731, Cl. 364-200.000.
Hood, John W.: *See*—
Twiford, Richard L.; and Hood, John W., 4,467,708, Cl. 99-450.800.
Hooper, Raymond C.: *See*—
Hensel, Paul C.; and Hooper, Raymond C., 4,468,765, Cl. 370-1.000.
Hoover Company, The: *See*—
Buchtel, Dean H., 4,467,493, Cl. 15-323.000.
Hoover Universal, Inc.: *See*—
Hafele, Robert X., 4,468,368, Cl. 264-530.000.
Hopkins, Jon D.: *See*—
Clark, Paul M.; Fenwick, Danny L.; and Hopkins, Jon D., 4,468,532, Cl. 200-81.90R.
Hopkins, Thomas R., to Phillips Petroleum Company. Cell culture control. 4,468,455, Cl. 435-3.000.
Hori, Kohei: *See*—
Ueno, Makoto; and Hori, Kohei, 4,467,758, Cl. 123-198.00F.
Horne, Fred H., to Ellis Paperboard Products, Inc. Composite structural material and method with load bearing applications. 4,467,728, Cl. 108-51.100.
Horton, Edward E., to Global Marine, Inc. Tension-leg off shore platform. 4,468,157, Cl. 405-224.000.
Hoshino, Hiroshi: *See*—
Fujiwara, Yoshiro; Kojima, Yuji; Yamada, Sumio; Hoshino, Hiroshi; and Wakatsuki, Noboru, 4,468,582, Cl. 310-312.000.
Hoshiro, Takeshi; and Kanamori, Katsuo, to Mitsuboshi Belting Ltd. Toothed belt manufacture. 4,468,211, Cl. 474-205.000.
Hosler, John F.: *See*—
Clarke, Theodore R.; and Hosler, John F., 4,468,264, Cl. 156-62.200.
Hosoe, Katsuharu: *See*—
Takasu, Yasuhito; Iwata, Toshiharu; and Hosoe, Katsuharu, 4,467,764, Cl. 123-416.000.
Hosoi, Noriyuki: *See*—
Mikami, Takeshi; and Hosoi, Noriyuki, 4,468,446, Cl. 430-138.000.
Houghton, Leonard E.: *See*—
Coffee, Ronald A.; Houghton, Leonard E.; Bennett, Peter C.; and Johnson, Graham C., 4,467,961, Cl. 239-1.000.
Howie, Robert K., Jr., to Grigoleit Company, The. Method of finishing aluminum sheets. 4,467,515, Cl. 29-527.200.
Hoya Corporation: *See*—
Chikano, Mitsuo, 4,468,102, Cl. 350-581.000.
Hsing, To R.: *See*—
Stoffel, James C.; Hsing, To R.; and Tandon, Jagdish C., 4,468,704, Cl. 358-282.000.
Huggins, Ronald D., to Anvil Corporation. Rotary tubing cutter. 4,467,682, Cl. 82-73.000.
Hughes Aircraft Company: *See*—
Salvatore, Jeremiah O., 4,467,985, Cl. 244-135.00R.
Hughes, William L., to Hewlett-Packard Company. Magnetically regulated power supply. 4,468,723, Cl. 363-82.000.
Hujioka, Yoshiro: *See*—
Yoshiwa, Masao; Hujioka, Yoshiro; Tokai, Masakuni; and Muro, Mikio, 4,467,958, Cl. 237-2.00B.
Hummer, Gilbert C., to Deka Plastics, Inc. Receptacle for holding plural size containers. 4,467,934, Cl. 220-85.00H.
Humphrey, Peter: *See*—
Pinsley, Jules, 4,468,108, Cl. 354-293.000.
Hunnebeck GmbH: *See*—
Markewitz, Wolfgang; and Schwechheimer, Heinz, 4,467,993, Cl. 249-28.000.
Hunt, Barry F.: *See*—
Leavitt, Steven C.; Larsen, Hugh G.; and Hunt, Barry F., 4,468,747, Cl. 364-577.000.
Hurley, James R.; and Birkner, Joseph R., to Thermo Electron Corporation. Radiant/jet impingement gas-fired cooking kettle. 4,467,783, Cl. 126-378.000.
Hurst, James A.; and Jackson, Peter, to Imperial Chemical Industries, PLC. Determining valve position. 4,468,559, Cl. 250-303.000.
Hutcheson, Lynn D.; and Tamura, Poohsan N., to Honeywell Inc. Integrated optical time integrating correlator. 4,468,084, Cl. 350-96.110.
Hutchinson, John W., to American Sterilizer Company. Conduit for apparatus discharging a liquid. 4,467,830, Cl. 137-590.000.
Ibsen, Barrie G. Shaped charge and carrier assembly therefor. 4,467,878, Cl. 175-4.600.
Icaro Oliveri & C. Minuterie Metalliche S.p.A.: *See*—
Olivieri, Icaro, 4,467,538, Cl. 36-121.000.
Ide, Yoshiaki, to Celanese Corporation. Process for extruding thermotropic liquid crystalline polymers. 4,468,364, Cl. 264-176.00R.
Igarashi, Hitoshi: *See*—
Shimizu, Shigeaki; Kubo, Yoshimi; Suzuki, Tetsuo; Kizaki, Takashi; and Igarashi, Hitoshi, 4,468,719, Cl. 361-433.000.
Igawa, Tatsuo: *See*—
Sone, Masazumi; Hirota, Yukitsugu; Miyashita, Takao; and Igawa, Tatsuo, 4,468,543, Cl. 200-19.0DR.
Iida, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Document size conversion circuit for a document filing system. 4,468,755, Cl. 364-900.000.
Iizuka, Haruhiko; and Sugasawa, Fukashi, to Nissan Motor Company, Limited. Split engine control system. 4,467,602, Cl. 60-276.000.
Ikeda Bussan Company, Limited: *See*—
Nagatake, Hiroshi; and Hayashi, Keiji, 4,467,484, Cl. 5-449.000.
Ikeda, Junichi; Utsumi, Noriyuki; and Otani, Yukio, to Tokico Ltd. Robot. 4,468,695, Cl. 358-101.000.
Ikeda, Kenichi: *See*—
Sasaki, Tamotsu; Takagaki, Tetsuya; and Ikeda, Kenichi, 4,468,195, Cl. 432-36.000.
Ikeda, Seiji; Ono, Katsuyuki; and Matsumura, Shozo, to Maeda Metal Industries, Ltd. Bolt tightening device having auxiliary handle. 4,467,676, Cl. 81-56.000.
Ikegami Tsushinki Co., Ltd.: *See*—
Fujita, Shuji; Sugizaki, Kennosuke; and Kiyota, Keiichi, 4,468,693, Cl. 358-78.000.
Ikemori, Keiji, to Canon Kabushiki Kaisha. Telephoto objective. 4,468,099, Cl. 350-454.000.
Ikemoto, Kazuhito: *See*—
Katayama, Nobuaki; Terakura, Yukio; Ikemoto, Kazuhito; and Sasaki, Kan, 4,467,665, Cl. 74-339.000.
Ikuta, Hironori: *See*—
Machida, Yoshimasa; Saito, Isao; Sugiyama, Isao; Negi, Shigeto; Nomoto, Seiichiro; Ikuta, Hironori; Yamauchi, Hiroshi; and Kitoh, Kyosuke, 4,468,394, Cl. 424-246.000.
Ikuta, Yasuhiro: *See*—
Matsuhiro, Ryuichi; Moriguchi, Koichi; Iwamoto, Kenzi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,467,608, Cl. 60-602.000.
Iliin, Valentin A.: *See*—
Kreinin, Efim V.; Smolkov, Anatoly N.; Iliin, Valentin A.; and Golykh, Vladimir T., deceased, 4,467,779, Cl. 126-91.00A.
Illinois Tool Works Inc.: *See*—
Smali, Edith M., 4,467,987, Cl. 248-68.100.
Imamura, Kazunori: *See*—
Tanimoto, Akikazu; and Imamura, Kazunori, 4,468,120, Cl. 356-237.000.
IMI Marston Limited: *See*—
Grosvenor, Ronald L., 4,468,812, Cl. 383-108.000.
IML Corporation: *See*—
Okey, David W., 4,468,431, Cl. 428-317.700.
Immunomed Corp.: *See*—
Zeya, Hasan I., 4,468,410, Cl. 427-2.000.
Imperial Chemical Industries PLC: *See*—
Caunt, Anthony D.; Gavens, Paul D.; and McMeeking, John, 4,468,477, Cl. 502-104.000.
Coffee, Ronald A.; Houghton, Leonard E.; Bennett, Peter C.; and Johnson, Graham C., 4,467,961, Cl. 239-1.000.
Hurst, James A.; and Jackson, Peter, 4,468,559, Cl. 250-303.000.
Ino, Tatsuo: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.
Inokuchi, Toshiyuki, to Ricoh Company, Ltd. Dach mirror array. 4,468,094, Cl. 350-299.000.
Inoue, Eiichi: *See*—
Shimizu, Isamu; Ogawa, Kyosuke; Inoue, Eiichi; and Kanbe, Junichiro, 4,468,443, Cl. 430-60.000.
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, to Chisso Corporation. Liquid-crystalline phenylcyclohexane derivatives. 4,468,340, Cl. 252-299.630.
Inoue, Masao; and Suzuki, Shingo, to Mitsubishi Rayon Co., Ltd. Rear projection screen. 4,468,092, Cl. 350-128.000.
Inoue, Toshifumi: *See*—
Yamada, Mitsuhiko; Nishida, Tukasa; and Inoue, Toshifumi, 4,468,692, Cl. 358-76.000.
Institut Francais du Petrole: *See*—
Levallois, Emile; Szabo, Rene ; Clot, Jean; and Esteve, Daniel, 4,468,155, Cl. 405-170.000.
Ramet, Claude; and Rojey, Alexandre, 4,468,337, Cl. 252-67.000.
Institut Po Electronica PRI Ban Sofia: *See*—
Meyer, Yves H.; and Nentchev, Marin N., 4,468,775, Cl. 372-92.000.
Institut Problem Litya Akademii Nauk Ukrainskoi SSR: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; and Shumikhin, Vladimir S., 4,468,771, Cl. 374-131.000.
Instrumentation Laboratory Inc.: *See*—
Rolfe, Norman F., 4,468,608, Cl. 324-51.000.
Intel Corporation: *See*—
Kung, Roger L.; Spitz, Jonathan N.; and Flannagan, Stephen T., 4,468,759, Cl. 365-201.000.
Interkal, Inc.: *See*—
Blanchard, Russell O.; Wolff, Douglas F.; Steele, Charles E.; and Molloy, Richard P., deceased, 4,467,569, Cl. 52-9.000.
International Business Machines Corporation: *See*—
Bansal, Jai P.; Bertin, Claude L.; and Troutman, Ronald R., 4,467,518, Cl. 29-571.000.
Blair, William W.; Doran, Samuel K.; and Langner, Guenther O., 4,468,565, Cl. 250-491.100.
Bogaczyk, Francis W.; Croll, Richard C.; Purcell, Billy D.; and Toutant, Edward E., 4,467,976, Cl. 242-67.30R.
Chamoff, Martin E.; and Piller, Don W., 4,468,750, Cl. 364-900.000.
Edgar, Albert D., 4,468,694, Cl. 358-93.000.

George, Dennis R.; Steinmetz, Michael J.; and Weber, Robert A., 4,468,219, Cl. 604-66.000.
Glang, Reinhard; Ku, San-Mei; and Schmitt, Alfred, 4,467,519, Cl. 29-576.00B.
Gotze, Volkmar; and Potz, Gunther, 4,468,735, Cl. 364-200.000.
Hohn, Fritz-Jurgen, 4,468,586, Cl. 313-336.000.
Lanier, Charles S.; Maxwell, Hiram M.; McKay, Roger E.; and Weiss, Leonard, 4,468,734, Cl. 364-200.000.
Raver, Norman, 4,468,732, Cl. 364-200.000.

International Flavors & Fragrances Inc.: *See*—
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,467,820, Cl. 131-276.000.

International Hydron Corporation: *See*—
Rawlings, David L., 4,468,184, Cl. 425-73.000.

International Telephone and Telegraph Corporation: *See*—
Twiford, Richard L.; and Hood, John W., 4,467,708, Cl. 99-450.800.

Intersil, Inc.: *See*—
Rosenthal, Bruce, 4,468,686, Cl. 357-53.000.

Inukai, Takashi: *See*—
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,468,340, Cl. 252-299.630.

Ippen, Jakob; and Stuttgen, Friedel, to Bayer Aktiengesellschaft. Tire for lorries. 4,467,852, Cl. 152-158.000.

Irie, Nobuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Manufacturing a radial tire and apparatus for practicing said method. 4,468,267, Cl. 156-132.000.

Irwin International, Inc.: *See*—
Mueller, Joseph H.; Dawson, Ronald G.; and Irwin, Samuel N., 4,468,712, Cl. 360-106.000.

Irwin, Samuel N.: *See*—
Mueller, Joseph H.; Dawson, Ronald G.; and Irwin, Samuel N., 4,468,712, Cl. 360-106.000.

Ishida, Shinya; and Miyata, Masayoshi, to Kinki Nippon Tetsudo Kabushiki Kaisha; and Kinki Sharyo Kabushiki Kaisha. Electric light display apparatus of light blocking type. 4,468,660, Cl. 340-764.000.

Ishikawa, Takayoshi: *See*—
Genba, Yasushi; Tamaru, Shigemi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,081, Cl. 339-176.00M.
Kodera, Toshihiko; Eguchi, Kiyoshi; Ishikawa, Takayoshi; Genba, Yasushi; Tamaru, Shigemi; and Satou, Susumu, 4,468,533, Cl. 200-153.0SC.
Tamaru, Shigemi; Genba, Yasushi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,082, Cl. 339-176.00M.

Ishikura, Shinichi; Kanda, Kazunori; Kida, Katsuaki; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. High solid coating composition containing novel microparticles of crosslinked copolymer containing amphoionic groups. 4,468,493, Cl. 525-123.000.

Ishioka, Yoshimichi: *See*—
Morishita, Teru; Ohtawa, Satoshi; Ishioka, Yoshimichi; and Suzuki, Toshikazu, 4,467,968, Cl. 239-703.000.

Isogai, Kiyoshi; Koga, Ituo; Yamada, Yutaka; and Haruta, Kazumi, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Flow control device of a helically-shaped intake port. 4,467,750, Cl. 123-188.00M.

Israel Aircraft Industries, Ltd.: *See*—
Azulai, Max; Bar-Nefy, Simcha; and Tiomkin, Michael, 4,467,694, Cl. 89-1.00M.

Istrati, Delilah J.: *See*—
Istrati, Konrad C.; and Istrati, Delilah J., 4,468,036, Cl. 273-271.000.

Istrati, Konrad C.; and Istrati, Delilah J. Board game apparatus. 4,468,036, Cl. 273-271.000.

Ito, Hisakatsu: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Ito, Iko; Toyoshima, Yoshiki; Takahashi, Tsutomu; and Saito, Noriaki, to Sumitomo Chemical Company, Limited. Glycidyl ether of novolak type substituted phenolic resin, process for producing the same, and encapsulating compound composed mainly of the same. 4,468,508, Cl. 525-507.000.

Itoh, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Compact telephoto zoom lens system. 4,468,098, Cl. 350-427.000.

Itoh, Takayuki; and Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide-angle photographic lens. 4,468,100, Cl. 350-463.000.

ITT Industries, Inc.: *See*—
Scovell, Peter D.; Rosser, Paul J.; and Tomkins, Gary J., 4,468,308, Cl. 204-192.00R.

Itzkan, Irving, to Avco Everett Research Laboratory, Inc. Method for laser melting of silicon. 4,468,279, Cl. 156-617.0SP.

Iwabuchi, Mitsunobu: *See*—
Narukawa, Yasunori; and Iwabuchi, Mitsunobu, 4,468,630, Cl. 330-267.000.

Iwamoto, Kenzi: *See*—
Matushiro, Ryuichi; Moriguchi, Koichi; Iwamoto, Kenzi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,467,608, Cl. 60-602.000.

Iwanaga, Kazuyoshi: *See*—
Sugano, Kazuhiko; and Iwanaga, Kazuyoshi, 4,467,675, Cl. 74-869.000.

Iwao, Noriaki; and Abe, Akira, to Tomy Kogyo Company, Inc. Toy vehicle capable of changing size and shape. 4,467,556, Cl. 446-230.000.

Iwasaki, Akio: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Iwata, Hideki, to Nel-Tech Development, Inc. Multiplex security system using remote microprocessors. 4,468,655, Cl. 340-518.000.

Iwata, Kazutoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic insulating tape wrapping apparatus. 4,467,973, Cl. 242-7.080.

Iwata, Toshiharu: *See*—
Takasu, Yasuhito; Iwata, Toshiharu; and Hosoe, Katsuharu, 4,467,764, Cl. 123-416.000.

Jackson, Peter: *See*—
Hurst, James A.; and Jackson, Peter, 4,468,559, Cl. 250-303.000.

Jackson, Sidney B.: *See*—
Birch, Stanley A.; Jackson, Sidney B.; Edmonds, Eric J. F.; Gigg, Robert V.; and Haggert, Norman L., 4,467,986, Cl. 244-147.000.

Jackson, Winston J., Jr.: *See*—
Morris, John C.; and Jackson, Winston J., Jr., 4,468,510, Cl. 528-298.000.

Jacquemet, Georges, to Martelec Societe Civile Particuliere. Electromagnetic percussion implement. 4,468,594, Cl. 318-130.000.

Jaeger, Thomas S., to Honeywell Inc. Control system for controlling the fuel/air ratio of combustion apparatus. 4,468,192, Cl. 431-20.000.

Jagenberg AG: *See*—
Zodrow, Rudolf, 4,467,847, Cl. 141-98.000.

Jagnow, Paul G.; and Vail, David K., to Rockwell International Corporation. Three-state digital mixer-driver circuit. 4,468,784, Cl. 375-1.000.

Jain, Aloke K.: *See*—
Lukens, James E.; Jain, Aloke K.; and Mankiewich, Paul M., 4,468,635, Cl. 331-107.00S.

Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM A.B. Oriented plastic container. 4,467,929, Cl. 215-1.00C.

Jakobsen, Kjell M.: *See*—
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larsen, Lars G., 4,468,187, Cl. 425-363.000.

Jameson, Neal E., to FMC Corporation. Apparatus for extending and retracting telescoping booms and pipelines. 4,468,166, Cl. 414-690.000.

Jamet, Michel; Urien, Jean Claude; and Bureau, Gerard, to Societe d'Etudes Techniques et d'Enterprises Generales Transmission Automatique & Informatique - Sodeteg Tai. Probe for a printed-circuit testing device, and a testing device incorporating said probe. 4,468,615, Cl. 324-158.00P.

Jandrell, Louis H. M., to Daca International B.V. Radiation and static electricity suppression device. 4,468,702, Cl. 358-245.000.

Janome Sewing Machine Co., Ltd.: *See*—
Makabe, Hachiro; Watanabe, Kazuo; and Takahashi, Yoshitaka, 4,467,740, Cl. 112-158.00E.

Jansen, Bernard L.: *See*—
Clifford, Thomas J.; and Jansen, Bernard L., 4,468,656, Cl. 340-539.000.

Jansen, Helmut, to Robert Bosch GmbH. Apparatus for molding a strand of caramel candy. 4,468,185, Cl. 425-133.100.

Janssen, Klaus; Meier, Jurgen; and Frank, Siegfried, to Preussag Aktiengesellschaft Metall. Method of disposal or temporary storage of waste material. 4,468,154, Cl. 405-128.000.

Japan Chemical Research Co., Ltd.: *See*—
Hiratani, Hajime; Uchida, Naomi; and Nishimura, Toyohiko, 4,468,344, Cl. 260-112.00R.

Japan Synthetic Rubber Co., Ltd.: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,468,496, Cl. 525-233.000.

Japanese National Railways: *See*—
Miura, Azusa; Kambara, Kesao; Kinoshita, Takashi; Suzuki, Toshio; and Yonehata, Yuzuru, 4,468,572, Cl. 307-69.000.

Jarrett, Bobby R.: *See*—
Waters, William M.; and Jarrett, Bobby R., 4,468,794, Cl. 375-103.000.

Jayem Dialer Corp.: *See*—
Samuel, Richard I.; and Smith, Fred J., 4,468,529, Cl. 179-18.0BA.

Jean Walterscheid GmbH: *See*—
Herchenbach, Paul; and Konrad, Mathias, 4,468,206, Cl. 464-37.000.

Jeffery, Michael C.: *See*—
Metcalf, Eric; and Jeffery, Michael C., 4,468,770, Cl. 371-42.000.

Jenden, Donald J.; Silverman, Robert W.; and Lee, Frederick C., to University of California, The Regents of. Microprocessor system for quantitative chromatographic data analysis. 4,468,742, Cl. 364-497.000.

Jenkins, Claire L., to Rock Leasing, Inc. Display case with a hook locking mechanism. 4,468,067, Cl. 312-140.000.

Jennings, Frederick R., to Pneumatic Scale Corporation. Method of nesting multiple paperboard carton blanks. 4,468,212, Cl. 493-52.000.

Jensen, Marvin E., to Hollister Incorporated. Wound drainage device with resealable access cap. 4,468,227, Cl. 604-327.000.

JEOL Ltd.: *See*—
Tsuno, Katsushige; and Ueno, Katsuyoshi, 4,468,563, Cl. 250-396.0ML.

Jernigan, Jerry. Bubble blowing device. 4,467,552, Cl. 446-15.000.

Jodon Engineering Associates, Inc.: *See*—
Gillespie, John W.; and Haddox, Mark L., 4,467,763, Cl. 123-414.000.

John, Waldemar; and Tucci, John J., to AMP Incorporated. Wire insertion apparatus. 4,467,516, Cl. 29-566.400.

Johne, Frank; Hartkamp, Hans G.; and Burmester, Hans-Georg. Tool head. 4,467,679, Cl. 82-36.00R.
Johns Hopkins University, The: *See*—
Murphy, John C.; and Aamodt, Leonard C., 4,468,136, Cl. 374-45.000.
Johnsen, Oystein, to Myrens Verksted A/S. Method of gas treatment of fluffed pulp. 4,468,286, Cl. 162-17.000.
Johnson, Charles R.; Ward, Phillip W.; Lindley, Joe H.; Maher, Robert A.; Holmes, Jerry D.; and Fuchser, Troy D., to Texas Instruments Incorporated. Global position system (GPS) multiplexed receiver. 4,468,793, Cl. 375-97.000.
Johnson, Gordon C.: *See*—
Weinberg, Kurt; and Johnson, Gordon C., 4,468,489, Cl. 524-136.000.
Johnson, Graham C.: *See*—
Coffee, Ronald A.; Houghton, Leonard E.; Bennett, Peter C.; and Johnson, Graham C., 4,467,961, Cl. 239-1.000.
Johnson, John E., Jr.: *See*—
Kubozoe, Morioki; Satow, Hisasi; and Johnson, John E., Jr., 4,468,560, Cl. 250-311.000.
Johnson, Lewis A.; and Wirostko, Emil. Method for treatment of rheumatoid arthritis. 4,468,398, Cl. 424-250.000.
Johnson, Robert B.; Nibby, Chester M., Jr.; and Salas, Edward R., to Honeywell Information Systems Inc. Identification apparatus for use in a controller to facilitate the diagnosis of faults. 4,468,731, Cl. 364-200.000.
Johnson Service Company: *See*—
Spence, Scott L., 4,467,998, Cl. 251-58.000.
Johnston, David F. Vaulting pole end plug. 4,468,024, Cl. 272-104.000.
Jolner, Jorgen: *See*—
Kawert, Kawe, 4,468,326, Cl. 210-619.000.
Jones, Clarence L., to Pitre-Jones, Inc. Bilge pump activator switch. 4,468,546, Cl. 200-84.00B.
Jones, Frank T., III: *See*—
Sloan, James W.; Tran, Truoc T.; and Jones, Frank T., III, 4,468,411, Cl. 427-8.000.
Jones, John: *See*—
Langford, Cooper A.; Jones, John; and Riddell, William D., 4,467,785, Cl. 126-400.000.
Jones, Judson O. Industrial vacuum cleaner. 4,467,494, Cl. 15-353.000.
Jones, Michael D.: *See*—
Malin, Nancy E.; Fayerman, Jeffrey T.; Jones, Michael D.; Mabe, James A.; and Nakatsukasa, Walter M., 4,468,462, Cl. 435-253.000.
Jones, Stephen G. B.: *See*—
Brown, Arthur D.; and Jones, Stephen G. B., 4,468,327, Cl. 210-626.000.
Jonsson, Gunther: *See*—
Sikander, Ake; Bjorkman, Ake; and Jonsson, Gunther, 4,468,011, Cl. 266-149.000.
Jorss, Norbert, to Pirzer Co. Infeed and discharge star. 4,467,909, Cl. 198-481.000.
Joseph, Horst G.: *See*—
Galow, Manfred; Flockenhaus, Claus; Meckel, Joachim; Joseph, Horst G.; and Gabriel, Gunter, 4,468,288, Cl. 201-41.000.
Joseph, James D.: *See*—
Carrison, Craig L.; Joseph, James D.; and Narendra, Patrenahalli M., 4,468,727, Cl. 364-200.000.
Journoux, Jean-Pierre: *See*—
Boyer, Robert; and Journoux, Jean-Pierre, 4,468,564, Cl. 250-427.000.
Joy Manufacturing Company: *See*—
LeBlanc, Louis H., 4,467,699, Cl. 91-25.000.
Joyama, Norio: *See*—
Oiso, Hisayoshi; and Joyama, Norio, 4,467,711, Cl. 99-577.000.
Jurgens, Rainer, to Christensen, Inc. Telemetry equipment in modules. 4,468,762, Cl. 367-83.000.
Jurgutis, John A. Human ligament replacement. 4,467,478, Cl. 3-1.000.
Justice, David D.: *See*—
Kadija, Igor V.; and Justice, David D., 4,468,312, Cl. 204-284.000.
Kaatz, Robert H. Weeding tool for mounting on fingers of user's hand. 4,467,873, Cl. 172-370.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Takeuchi, Hiroshi, 4,467,905, Cl. 192-106.200.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Kitagawa, Kazumi, 4,467,881, Cl. 177-50.000.
Mikami, Yoshiharu, 4,467,882, Cl. 177-58.000.
Minamida, Kazukiyo; and Fujitani, Yugo, 4,467,880, Cl. 177-25.000.
Kabushiki Kaisha Kito: *See*—
Nakamura, Takayoshi, 4,468,005, Cl. 254-350.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kuromoto, Kazunori, 4,468,162, Cl. 414-4.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Kataoka, Kenzo; Matoba, Kazunari; and Osada, Shinichi, 4,468,198, Cl. 433-63.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Takagi, Michiaki; and Momosaki, Eishi, 4,468,634, Cl. 331-60.000.
Kabushiki Kaisha Tokai-Rika-Denki Seisakusho: *See*—
Mori, Shinji; and Tamura, Keiichi, 4,467,981, Cl. 242-107.40A.
Tajima, Hiromi; and Fujiwara, Akinori, 4,467,982, Cl. 242-107.600.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Araki, Hidejiro, 4,467,592, Cl. 57-96.000.
Kadija, Igor V.; and Justice, David D., to Olin Corporation. Reticulate electrode for electrolytic cells. 4,468,312, Cl. 204-284.000.
Kadija, Igor V., to Olin Corporation. Preparing porous diaphragms for electrolytic cells having non-uniform hydrophobicity. 4,468,360, Cl. 264-83.000.
Kadota, Yuji: *See*—
Fujiwara, Haruyoshi; and Kadota, Yuji, 4,467,536, Cl. 34-116.000.
Kaeser, Charles. Automatic mixing device for use in a shower head. 4,467,964, Cl. 239-312.000.
Kaganov, Alan L.: *See*—
Hardy, Thomas G.; Kaganov, Alan L.; and Pace, W. G., 4,467,804, Cl. 128-334.00C.
Kaiser Aerospace & Electronics Corporation: *See*—
Yamane, Kiyoshi E.; Thomas, Timothy C.; and Tostado, Jose J., 4,467,647, Cl. 73-321.000.
Kaiser, Hans; Winterhalter, Walter; Wild, Karl; and Gruner, Peter, to Gebruder Junghans GmbH. Coil strip safety device for spinning projectiles. 4,467,723, Cl. 102-240.000.
Kaiser, Jurgen, to Siemens Aktiengesellschaft. Method of winding closed cores, especially ring cores for electrical coils, and device for performing the method. 4,467,972, Cl. 242-4.00R.
Kakegawa, Makoto; Nishikawa, Mineki; and Kihara, Tomohiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Scintillation camera. 4,468,744, Cl. 364-527.000.
Kakuishi, Mitsuo: *See*—
Kato, Seiji; Ueno, Norio; and Kakuishi, Mitsuo, 4,468,749, Cl. 364-861.000.
Kaldun, Mark R.: *See*—
Heavey, Frederick D.; and Kaldun, Mark R., 4,468,571, Cl. 307-66.000.
Kalmanash, Michael H., to United Technologies Corporation. Stroke during retrace color switch. 4,468,691, Cl. 358-73.000.
Kalt, Charles G. Electromechanical reflective display device. 4,468,663, Cl. 340-815.270.
Kalz, Dietmar: *See*—
Thomas, Thomas J.; Hoguet, Robert G.; Sandefur, Charles W.; and Kalz, Dietmar, 4,468,230, Cl. 8-528.000.
Kamata, Isao; and Ohyama, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas-insulated switchgear. 4,468,716, Cl. 361-333.000.
Kambara, Kesao: *See*—
Miura, Azusa; Kambara, Kesao; Kinoshita, Takashi; Suzuki, Toshio; and Yonehata, Yuzuru, 4,468,572, Cl. 307-69.000.
Kaminski, James J.: *See*—
Gold, Elijah H.; Kaminski, James J.; and Puchalski, Chester, 4,468,400, Cl. 424-256.000.
Kamiyama, Fumio; Kohara, Minoru; Nagata, Mituo; and Araki, Yasuhiko, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Filler for liquid chromatography useful for separating a hemoglobin variant in blood. 4,468,330, Cl. 210-656.000.
Kammiller, Neil A., to Reliance Electric Company. Power supply having slope controlled output volt-ampere characteristic. 4,468,722, Cl. 363-71.000.
Kampe, Wolfgang: *See*—
Michel, Helmut; Kampe, Wolfgang; Ofenloch, Roland; Dietmann, Karl; and Sponer, Gisbert, 4,468,520, Cl. 424-274.000.
Kampf, Gunther: *See*—
Benninghoven, Alfred; Kampf, Gunther; and Holm, Reimer, 4,468,468, Cl. 436-173.000.
Kampichler, Gunter; Kuschmierz, Heinz; and Scheak, Bernhard, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,467,767, Cl. 123-467.000.
Kanai, Shunichiro: *See*—
Morimura, Hiroaki; Minami, Hideki; and Kanai, Shunichiro, 4,467,992, Cl. 248-659.000.
Kanai, Wataru, to Tokyo Ohka Kogyo Kabushiki Kaisha. Photosensitive bisazide composition for dry development. 4,468,447, Cl. 430-197.000.
Kanamori, Katsuo: *See*—
Hoshiro, Takeshi; and Kanamori, Katsuo, 4,468,211, Cl. 474-205.000.
Kanatani, Yoshiharu: *See*—
Ohba, Toshihiro; Kanatani, Yoshiharu; Kinoshita, Hiroshi; Sogabe, Morihisa; and Fujioka, Yoshihide, 4,468,659, Cl. 340-719.000.
Kanbe, Junichiro: *See*—
Shimizu, Isamu; Ogawa, Kyosuke; Inoue, Eiichi; and Kanbe, Junichiro, 4,468,443, Cl. 430-60.000.
Kanda, Kazunori: *See*—
Ishikura, Shinichi; Kanda, Kazunori; Kida, Katsuaki; and Mizuguchi, Ryuzo, 4,468,493, Cl. 525-123.000.
Kanda, Shuichi, to Takara Co., Ltd. Cooking toy. 4,467,553, Cl. 446-136.000.
Kaneda, Hiroshi; Sato, Hiroshi; Nashimoto, Katsunori; and Matsui, Tadashi, to Nippon Steel Corporation. Method of cooling hot-rolled wire rods. 4,468,262, Cl. 148-156.000.
Kaneko, Masahiro; Asanuma, Tadashi; Uchikawa, Nobutaka; Fujio, Ichiro; and Shiomura, Tetsunosuke, to Mitsui Toatsu Chemicals, Incorporated. Washing and removal method of high molecular substances. 4,468,257, Cl. 134-22.130.
Kanetsu Kogyo Kabushiki Kaisha: *See*—
Barbee, J. Brent, 4,468,650, Cl. 340-58.000.
Matsuhashi, Takeo, 4,468,649, Cl. 335-295.000.
Kapral, Christopher W., to GTE Network Systems Incorporated. Charge redistribution mu-law PCM decoder. 4,468,653, Cl. 340-347.0DA.
Kapral, Christopher W., to GTE Network Systems Incorporated. Charge redistribution a-law PCM decoder. 4,468,654, Cl. 340-347.0DA.

Karlsson, Ingemar; Svensson, Percyval; Nelenius, Eric; Svensson, Goran; Ydrefors, Axel; and Lindstrom, Bengt, to Flakt AB. Arrangement for pulling the tail of a web-like material through a drying or cooling plant. 4,467,950, Cl. 226-91.000.

Karning, Heinrich; and Prein, Franz. Wave guide lazer with frustration element. 4,468,778, Cl. 372-108.000.

Kasashima, Hirokazu: *See*—
Oka, Toshihisa; Nakanishi, Hiroaki; Takamatsu, Ryoichi; Morioka, Takayuki; Okada, Masakazu; Hara, Hideyuki; and Kasashima, Hirokazu, 4,468,733, Cl. 364-200.000.

Kashima, Masao; and Miyashita, Yasuo, to Mitsubishi Mining & Cement Company, Ltd. Composition for ceramic dielectrics. 4,468,471, Cl. 501-135.000.

Kashima, Masao; and Miyashita, Yasuo, to Mitsubishi Mining & Cement Company, Ltd. Composition for ceramic dielectrics. 4,468,472, Cl. 501-137.000.

Kataoka, Kenzo; Matoba, Kazunari; and Osada, Shinichi, to Kabushiki Kaisha Morita Seisakunho. Mandibular motion reproducing device. 4,468,198, Cl. 433-63.000.

Kataoka, Yushin; Matsuda, Masaaki; Yoshitake, Hiroshi; and Hirose, Yoshikazu, to Simitomo Chemical Company, Limited. Method for recovery of gallium. 4,468,374, Cl. 423-112.000.

Katayama, Nobuaki; Terakura, Yukio; Ikemoto, Kazuhito; and Sasaki, Kan, to Toyota Jidosha Kogyo Kabushiki Kaisha. Synchronizing device for transmission. 4,467,665, Cl. 74-339.000.

Kates, James M.; and Bussgang, Julian J., to Signatron, Inc. Speech enhancement techniques. 4,468,804, Cl. 381-47.000.

Kato, Seiji; Ueno, Norio; and Kakuishi, Mitsuo, to Fujitsu Limited. Adjustable attenuator circuit. 4,468,749, Cl. 364-861.000.

Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, to Kureha Kagaku Kogyo Kabushiki Kaisha; Fuji Electric Company Limited; and Kawasaki Jukogyo Kabushiki Kaisha. Method of controlling air flow rate of fan. 4,468,171, Cl. 417-53.000.

Kauffeisen, Bernard: *See*—
Schellberg, Franz; Kauffeisen, Bernard; Oberbach, Manfred; Zingel, Gerhard; and Wieland, Gunter, 4,468,780, Cl. 373-75.000.

Kaufman, Nancy K.: *See*—
Chen, Anthony B.; Harte, Richard A.; and Kaufman, Nancy K., 4,468,371, Cl. 422-102.000.

Kavoussi, Barry T.; and Bergholz, Eugene W., to General Electric Company. Line-locked digital fluorography system. 4,468,698, Cl. 358-111.000.

Kawaguchi, Hiroshi: *See*—
Hanada, Minoru; Tsunakawa, Mitsuaki; Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, 4,468,386, Cl. 424-181.000.

Kawahara, Hideo; Nagayama, Hirotsugu; and Honda, Hisao, to Nippon Sheet Glass Co., Ltd. Method for making a silicon dioxide coating. 4,468,420, Cl. 427-397.700.

Kawai, Hisasi: *See*—
Matushiro, Ryuichi; Moriguchi, Koichi; Iwamoto, Kenzi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,467,608, Cl. 60-602.000.

Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,467,688, Cl. 84-1.010.
Deutsch, Ralph, 4,467,691, Cl. 84-1.240.

Kawakubo, Yukio: *See*—
Takemori, Satoshi; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,468,777, Cl. 372-107.000.

Kawamoto, Mutsumi, to Aisin Warner Kabushiki Kaisha. Working fluid distributing system for a belt drive continuously-variable speed automatic transmission. 4,467,669, Cl. 74-688.000.

Kawamoto, Mutsumi, to Aisin Warner Kabushiki Kaisha. Belt drive continuously-variable speed automatic transmission. 4,467,670, Cl. 74-689.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.

Kawasaki, Kazumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for transporting sorted stacked matter. 4,468,165, Cl. 414-417.000.

Kawasaki Steel Corporation: *See*—
Ban, Tenji; Mochizuki, Kazuo; Sakamoto, Yasuhei; and Harada, Shunichi, 4,468,292, Cl. 204-27.000.
Matsui, Sigeo; Tukahara, Yogo; Hayashi, Shigeki; and Kumagai, Masahiko, 4,468,238, Cl. 55-26.000.

Kawert, Kawe, to Jolner, Jorgen. Process in microbiological purification and a device and materials therefor. 4,468,326, Cl. 210-619.000.

Kayser-Roth Hosiery, Inc.: *See*—
Coble, William H.; Shields, Harper; and Farrell, Roscoe M., 4,467,626, Cl. 66-196.000.

Kazimirovskaya, Valentina B.: *See*—
Voronkov, Mikhail G.; Platonova, Ada T.; Annenkova, Vladislava Z.; Annenkova, Valentina M.; Kazimirovskaya, Valentina B.; and Ugrjumova, Galina S., 4,468,378, Cl. 424-81.000.

Kazuo, Itoi: *See*—
Fumio, Mori; Toshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, 4,468,521, Cl. 560-124.000.

KB Denver, Inc.: *See*—
Pounds, Walter R., 4,468,542, Cl. 200-5.00A.

Keiper, Francis P., Jr., to Lear Siegler, Inc. Ternary data transmission system. 4,468,787, Cl. 375-17.000.

Keller, Duane C. Method of and apparatus for orthopedic and/or orthodontic treatment. 4,468,196, Cl. 433-24.000.

Keller, Philip B. Toilet bowl water conditioner. 4,467,480, Cl. 4-225.000.

Kelley Company, Inc.: *See*—
Di Fonzo, Mark A., 4,467,731, Cl. 110-235.000.

Kelley, Hugh D.: *See*—
Trammel, Edward L.; and Kelley, Hugh D., 4,467,914, Cl. 198-861.000.

Kelly, David L.; and Turner, Frank E., to Burke Company, The. Assembly for anchoring an element to a slab. 4,468,149, Cl. 403-316.000.

Kelly, John W., to Haskel, Incorporated. Hydraulic swaging seal construction. 4,467,630, Cl. 72-62.000.

Kelly, Paul P.; and Bochantin Connor, Trudy A. Electrophotographic mixture containing toner particles and coated carrier particles. 4,468,445, Cl. 430-107.000.

Kelpien, Gary D.: *See*—
Chilluffo, Ronald L.; and Kelpien, Gary D., 4,468,633, Cl. 331-56.000.

Kemeny, George A.: *See*—
McNab, Ian R.; and Kemeny, George A., 4,467,696, Cl. 89-8.000.

Kendall, Debra L.: *See*—
Butler, James R.; Watson, James M.; Kendall, Debra L.; and Milkelson, Karen A., 4,468,343, Cl. 252-403.000.

Kenjyo, Hideyuki, to Olympus Optical Co. Ltd. Dual-loop jitter correction circuit for correcting the time base error of an information signal. 4,468,709, Cl. 358-322.000.

Kerotest Manufacturing Corp.: *See*—
Tremblay, Richard P., 4,468,002, Cl. 251-335.00B.

Kesse, Bernard G.: *See*—
Freeman, D. Bruce; Kesse, Bernard G.; and Thiel, Philip P., 4,468,418, Cl. 427-208.200.

Kettel, Hans, to Sauter Feinmechanik GmbH. Tool turret with revolving head. 4,467,680, Cl. 82-36.00A.

Kida, Katsuaki: *See*—
Ishikura, Shinichi; Kanda, Kazunori; Kida, Katsuaki; and Mizuguchi, Ryuzo, 4,468,493, Cl. 525-123.000.

Kihara, Tomohiko: *See*—
Kakegawa, Makoto; Nishikawa, Mineki; and Kihara, Tomohiko, 4,468,744, Cl. 364-527.000.

Kijima, Shizumasa: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, 4,468,458, Cl. 435-134.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.

Kikuchi, Yoshiki: *See*—
Nakajima, Hisao; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,468,676, Cl. 346-76.0PH.

Kildea, Robert J.: *See*—
Alcorta, Jorge A.; and Kildea, Robert J., 4,468,066, Cl. 308-187.000.

Killop, James T., to Anderson-Cook, Inc. Apparatus for splining thin-wall power transmission sleeves. 4,467,631, Cl. 72-88.000.

Kimura, Shigeru: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Kimura, Takeo: *See*—
Kuboyama, Keiji; Matsui, Takeki; and Kimura, Takeo, 4,468,415, Cl. 427-91.000.

King, Eddie W.: *See*—
Morgan, Annis R., Jr.; and King, Eddie W., 4,467,617, Cl. 62-180.000.

King, Harold B.; Lai, Ching C.; and Walker, Edward S., to General Electric Company. Tray loader method and apparatus for nuclear fuel pellets. 4,468,163, Cl. 414-21.000.

Kinghorn, Alan D.; and Marshall, Gary T., to University of Ill., The Board of Trustees of the. Purification of 12-O-tetradecanoylphorbol-13-acetate, phorbol, and 4α-phorbol from croton oil. 4,468,328, Cl. 210-634.000.

Kinki Nippon Tetsudo Kabushiki Kaisha: *See*—
Ishida, Shinya; and Miyata, Masayoshi, 4,468,660, Cl. 340-764.000.

Kinki Sharyo Kabushiki Kaisha: *See*—
Ishida, Shinya; and Miyata, Masayoshi, 4,468,660, Cl. 340-764.000.

Kino, Gordon S.: *See*—
Green, Jonathan B.; and Kino, Gordon S., 4,468,639, Cl. 333-153.000.

Kinoshita, Hiroshi: *See*—
Ohba, Toshihiro; Kanatani, Yoshiharu; Kinoshita, Hiroshi; Sogabe, Morihisa; and Fujioka, Yoshihide, 4,468,659, Cl. 340-719.000.

Kinoshita, Nobuyasu: *See*—
Nakamura, Shohei; and Kinoshita, Nobuyasu, 4,468,453, Cl. 430-269.000.

Kinoshita, Ryohei: *See*—
Tamura, Masayoshi; Kinoshita, Ryohei; Matsubayashi, Norio; Matsumoto, Mitsuharu; Sukeda, Toshiaki; and Hirakawa, Osamu, 4,468,075, Cl. 339-75.00M.

Kinoshita, Takao; and Onaka, Kazushige, to Nippon Air Brake Co., Ltd. Method of conditioning a rotary valve seat. 4,467,510, Cl. 29-157.10R.

Kinoshita, Takashi: *See*—
Miura, Azusa; Kambara, Kesao; Kinoshita, Takashi; Suzuki, Toshio; and Yonehata, Yuzuru, 4,468,572, Cl. 307-69.000.

Kinzer, Charles E.: *See*—
Palmer, James K.; Long, James C.; and Kinzer, Charles E., 4,467,644, Cl. 73-198.000.

Kinzl, Marwin; and Bergmann, Eduard, to Leopold Kostal GmbH & Co. KG. Method and apparatus for the electronic operation and monitoring of the opening cycle or closing cycle of electrically operable units. 4,468,596, Cl. 318-287.000.

Kirst, Herbert A.; and Toth, John E., to Eli Lilly and Company. C-20-And C-23-Modified macrolide derivatives. 4,468,511, Cl. 536-7.100.

Kirst, Herbert A.; and Truedell, Brenda A., to Eli Lilly and Company. 1-N-Acylated and 1-N-alkylated derivatives of 4-O-substituted-2-deoxystreptamine aminoglycosides. 4,468,512, Cl. 536-16.800.

Kirst, Herbert A.; and Truedell, Brenda A., to Eli Lilly and Company. 2'-N-Acylated and 2'-N-alkylated derivatives of 4-O-substituted-2-deoxystreptamine aminoglycosides. 4,468,513, Cl. 536-16.800.

Kiseev, Valery M.; Maidanik, Jury F.; and Gerasimov, Jury F., to Otdel Fiziko-Tekhnicheskikh Problem Energetiki Uralskogo Nauchnogo Tsentra Akademii Nauk SSSR. Heat-transporting device. 4,467,861, Cl. 165-104.220.

Kitadono, Kaoru: *See*—
Fujii, Yoshikazu; Kondo, Tomizou; Shinonaga, Hideo; and Kitadono, Kaoru, 4,468,412, Cl. 427-38.000.

Kitagawa, Kazumi, to Kabushiki Kaisha Ishida Koki Seisakusho. Span adjusting device in automatic weighing machine. 4,467,881, Cl. 177-50.000.

Kitano, Noritoshi, to Sankyo Company, Limited. Anthelmintic composition and the use thereof. 4,468,390, Cl. 424-232.000.

Kitauchi, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Temperature control system for an air conditioner. 4,467,616, Cl. 62-175.000.

Kitoh, Kyosuke: *See*—
Machida, Yoshimasa; Saito, Isao; Sugiyama, Isao; Negi, Shigeto; Nomoto, Seiichiro; Ikuta, Hironori; Yamauchi, Hiroshi; and Kitoh, Kyosuke, 4,468,394, Cl. 424-246.000.

Kiyota, Keiichi: *See*—
Fujita, Shuji; Sugizaki, Kennosuke; and Kiyota, Keiichi, 4,468,693, Cl. 358-78.000.

Kizaki, Takashi: *See*—
Shimizu, Shigeaki; Kubo, Yoshimi; Suzuki, Tetsuo; Kizaki, Takashi; and Igarashi, Hitoshi, 4,468,719, Cl. 361-433.000.

Kjessler & Mannerstrale AB.: *See*—
Langerbeck, Fritz, 4,467,573, Cl. 52-79.500.

Kjosavik, Dag, to Trallfa Underhaug A/S. Device for position measurement. 4,468,745, Cl. 364-559.000.

Klappert, Willi, to General Electric Company. Method of making a wound core for an electric transformer. 4,467,632, Cl. 72-147.000.

Klein, Hermann: *See*—
Becker, Wolfram; and Klein, Hermann, 4,467,774, Cl. 123-568.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Munch, Helmut, 4,468,176, Cl. 417-406.000.

Klimmek, William G.: *See*—
Berman, Max; Klimmek, William G.; and Konrad, Charles E., 4,468,599, Cl. 318-362.000.

Klingelhoefer, Hannsgeorg; and Rudolph, Klaus-Peter, to Bielomatik Leuze GmbH & Co. Method and apparatus for drawing flexible printing blocks onto printing rollers in an in register manner. 4,467,722, Cl. 101-426.000.

Klinkowski, Peter R.: *See*—
Freeman, Mark P.; and Klinkowski, Peter R., 4,468,306, Cl. 204-180.00P.

Knab, Rochus: *See*—
Rohde, Siegfried; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; and Schramm, Herbert, 4,467,634, Cl. 73-35.000.

Knaus, Edward E.; Warren, Brent K.; and Ondrus, Theodore A., to Canadian Patents & Development Limited. Analgesic substituted piperidylidene-2-sulfon(cyan)amide derivatives. 4,468,403, Cl. 424-267.000.

Knepper, Larimer J.: *See*—
Musser, Glenn A.; Swiler, Stuart O.; and Knepper, Larimer J., 4,467,819, Cl. 130-27.0JT.

Knickerbocker, Robert H., to Siemon Company, The. Electrical connectors and terminal connecting blocks. 4,468,079, Cl. 339-97.00P.

Knowles, Richard T., to Quest 80 Limited. Vehicle transmission systems. 4,468,209, Cl. 464-180.000.

Knuth, Manfred; and Homann, Thorsten, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method of recovering oil from oil-bearing vegetable matter. 4,467,713, Cl. 100-37.000.

Kobayashi, Heitaro. Motor vehicle. 4,468,051, Cl. 280-751.000.

Kobayashi, Kinzo: *See*—
Kubo, Takaaki; and Kobayashi, Kinzo, 4,467,897, Cl. 188-73.380.

Kobayashi, Masahiro: *See*—
Takahashi, Shigeyuki; Yoshida, Nobuyuki; and Kobayashi, Masahiro, 4,467,622, Cl. 62-354.000.

Kodera, Toshihiko; Eguchi, Kiyoshi; Ishikawa, Takayoshi; Genba, Yasushi; Tamaru, Shigemi; and Satou, Susumu, to Mitsubishi Denki Kabushiki Kaisha. Air circuit breaker. 4,468,533, Cl. 200-153.0SC.

Koehler, Rudolph A., to Noma Inc. Cord reel. 4,467,979, Cl. 242-96.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Grosshauser, Heinrich K., 4,467,719, Cl. 101-221.000.

Koga, Ituo: *See*—
Isogai, Kiyoshi; Koga, Ituo; Yamada, Yutaka; and Haruta, Kazumi, 4,467,750, Cl. 123-188.00M.

Koga, Keiichiro, to Kokusai Denshin Denwa Co., Ltd. Error correcting system for correcting two or three simultaneous errors in a code. 4,468,769, Cl. 371-37.000.

Kohara, Minoru: *See*—
Kamiyama, Fumio; Kohara, Minoru; Nagata, Mituo; and Araki, Yasuhiko, 4,468,330, Cl. 210-656.000.

Kohler, Gernot: *See*—
Naarmann, Herbert; Kohler, Gernot; and Schlag, Johannes, 4,468,291, Cl. 204-13.000.

Kohlhage, Hermann: *See*—
Volke, Hans-Werner; Hilkenmeier, Jurgen; Kohlhage, Hermann; and Tewes, Udo, 4,468,143, Cl. 400-248.000.

Koike, Kiyoshi, to Nissan Motor Company, Limited. Automotive vehicle body structure. 4,468,052, Cl. 280-784.000.

Koizumi, Hideaki; and Oishi, Kousuke, to Hitachi, Ltd. Spectrophotometric analyzer having dual monochromators. 4,468,121, Cl. 356-328.000.

Kojima, Yuji: *See*—
Fujiwara, Yoshiro; Kojima, Yuji; Yamada, Sumio; Hoshino, Hiroshi; and Wakatsuki, Noboru, 4,468,582, Cl. 310-312.000.

Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, to Laurel Bank Machine Co. Ltd. Automatic money depositing and disbursing machine provided with slidingly movable frame for supporting stacker box. 4,468,068, Cl. 312-333.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Koga, Keiichiro, 4,468,769, Cl. 371-37.000.

Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., to Deutsche Gardner-Denver GmbH. Power tool, in particular a hand-held compressed air screwdriver. 4,467,877, Cl. 173-12.000.

Komeno, Minoru: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.

Komori, Toshihisa: *See*—
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,467,855, Cl. 164-7.100.

Kondo, Tomizou: *See*—
Fujii, Yoshikazu; Kondo, Tomizou; Shinonaga, Hideo; and Kitadono, Kaoru, 4,468,412, Cl. 427-38.000.

Konermann, Erhard, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method of crown grinding gears having lengthwise curved teeth. 4,467,567, Cl. 51-287.000.

Konig, Helmut. Transport hanger for transporting dough portions. 4,467,906, Cl. 198-705.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Motohashi, Mitsuo; and Nemoto, Mitsugu, 4,468,113, Cl. 355-14.0TR.

Konnai, Makoto: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Omokawa, Hiroyoshi; Yoneyama, Koichi; Ushinohama, Kazuyuki; and Suzuki, Seiichi, 4,468,245, Cl. 71-88.000.

Konrad, Charles E.: *See*—
Berman, Max; Klimmek, William G.; and Konrad, Charles E., 4,468,599, Cl. 318-362.000.

Konrad, Mathias: *See*—
Herchenbach, Paul; and Konrad, Mathias, 4,468,206, Cl. 464-37.000.

Kontz, Robert F., to Owens-Illinois, Inc. Fixed jaw means for holding and rotating containers traveling around a turret periphery. 4,468,277, Cl. 156-567.000.

Koops, Wierd, to Staat der Nederlanden. Method and apparatus for cleaning up surface water. 4,468,323, Cl. 210-776.000.

Korb, Joseph: *See*—
Berryman, Walter H.; Manson, Peter J.; Hamley, Adrian H.; and Korb, Joseph, 4,467,646, Cl. 73-304.00C.

Kotani, Sho: *See*—
Adachi, Shichiro; and Kotani, Sho, 4,468,555, Cl. 219-237.000.

Kotliar, Abraham M.: *See*—
Degrassi, Alfieri; Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; and Mason, Charles D., 4,468,427, Cl. 428-220.000.

Kovach, Bruce F. Method of using frozen salt water to maintain a low cost, low energy consuming indoor or outdoor ice rink. 4,467,619, Cl. 62-235.000.

Kowa Co., Ltd.: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Kowalski, Alexander; Vogel, Martin; and Blankenship, Robert M., to Rohm and Haas Company. Sequential heteropolymer dispersion and a particulate materal obtainable therefrom, useful in coating compositions as a thickening and/or opacifying agent. 4,468,498, Cl. 525-301.000.

Kowata, Nobuo: *See*—
Sasano, Naoshige; and Kowata, Nobuo, 4,468,567, Cl. 250-577.000.

Koyama, Shigeo: *See*—
Yamagata, Ryutaro; Kozuka, Nobuhiko; Nishihama, Hitoshi; Koyama, Shigeo; and Sakai, Kazutada, 4,468,111, Cl. 355-3.0DD.

Koyama, Tamotsu: *See*—
Nakamura, Tutomu; and Koyama, Tamotsu, 4,468,584, Cl. 310-370.000.

Kozuka, Nobuhiko: *See*—
Yamagata, Ryutaro; Kozuka, Nobuhiko; Nishihama, Hitoshi; Koyama, Shigeo; and Sakai, Kazutada, 4,468,111, Cl. 355-3.0DD.

Kraft, Inc.: *See*—
McCain, George R.; and Blaetz, Philip H., 4,468,135, Cl. 374-44.000.

Kramer, Dennis: *See*—
DeClaire, Gerald; and Kramer, Dennis, 4,467,886, Cl. 180-197.000.

Kramer, James H.; Orndorff, Roy L., Jr.; Stephens, James M.; and Presutto, Vincent T., to B. F. Goodrich Company, The. Swivel. 4,468,056, Cl. 285-281.000.

Kramers, Aloysius A. J., to Akzona Incorporated. Latent contractable elastomers, composite yarns therefrom and methods of formation and use. 4,467,595, Cl. 57-225.000.

Krapcho, John, to E. R. Squibb & Sons, Inc. Esters of phosphinylalkanoyl substituted prolines. 4,468,519, Cl. 548-409.000.

Kraus, Dennis K.; and Richter, Sidney B., to PPG Industries, Inc. Herbicidally active benzoxazolyloxy benzoate derivatives. 4,468,244, Cl. 71-88.000.

Kraus, Willibald, to TRW Inc. Pipe fastener. 4,467,988, Cl. 248-68.100.

Krause, Werner; and Pieper, Werner, to Hoechst Aktiengesellschaft. Process for making 1-hydroxy-alkane-1-phosphonic acids. 4,468,355, Cl. 260-502.40R.

Kreibich, Willard H.: *See*—
Gillieo, Kenneth B.; and Kreibich, Willard H., 4,468,425, Cl. 428-172.000.

Kreisin, Efim V.; Smolkov, Anatoly N.; Iliin, Valentin A.; and Golykh, Vladimir T., deceased (by Ladygina, Natta T., administrator), to Vsesojuzny Nauchnoissledovatelsky Institut Ispolzovania Gaza V Narodnom Khozyaistve. Radiation tube. 4,467,779, Cl. 126-91.00A.

Kreuter, Kenneth G. System for supplying conditioned air, thermostat therefor and methods of making the same. 4,467,956, Cl. 236-49.000.

Kriegel, Harry F., to Royal-Apex Manufacturing Co. Inc. Gutter guard and locking clip therefor. 4,467,570, Cl. 52-12.000.

Kristiansson, Krister: *See*—
Malmqvist, Erik L.; and Kristiansson, Krister, 4,468,558, Cl. 250-253.000.

Kroner, Klaus, to U.S. Philips Corporation. Circuit arrangement for the control of the vertical deflection. 4,468,699, Cl. 358-148.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Schneider, Egon, 4,467,908, Cl. 198-441.000.

Krueger, Guenther. Sheet carrying a welded nut. 4,468,161, Cl. 411-171.000.

Krutsch, John R.: *See*—
Barlow, Gordon A.; and Krutsch, John R., 4,468,031, Cl. 273-110.000.

Ku, San-Mei: *See*—
Glang, Reinhard; Ku, San-Mei; and Schmitt, Alfred, 4,467,519, Cl. 29-576.00B.

Kubo, Takaaki; and Kobayashi, Kinzo, to Tokico Ltd. Disc brake with first and second springs for preventing the vibration of friction pad. 4,467,897, Cl. 188-73.380.

Kubo, Yoshimi: *See*—
Shimizu, Shigeaki; Kubo, Yoshimi; Suzuki, Tetsuo; Kizaki, Takashi; and Igarashi, Hitoshi, 4,468,719, Cl. 361-433.000.

Kubota, Ltd.: *See*—
Murakami, Shinichi; Sugitani, Junichi; and Yoshimoto, Teruo, 4,467,654, Cl. 73-640.000.
Taniguchi, Kotaro, 4,467,732, Cl. 110-259.000.

Kuboyama, Keiji; Matsui, Takeki; and Kimura, Takeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Indium-antimony complex crystal semiconductor and process for production thereof. 4,468,415, Cl. 427-91.000.

Kubozoe, Morioki; Satow, Hisasi; and Johnson, John E., Jr., to Hitachi, Ltd.; and Nissel Sangyo America, Ltd. Electron microscope equipped with measuring facility. 4,468,560, Cl. 250-311.000.

Kuchera, Ray A.: *See*—
Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., 4,468,182, Cl. 425-7.000.
Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., 4,468,183, Cl. 425-7.000.

Kuehl, Guenter H., to Mobil Oil Corporation. Hydrothermal activation of acid zeolites with alumina. 4,468,475, Cl. 502-71.000.

Kuehnle, Manfred R.; and Cahill, Lysle D., to Coulter Systems Corporation. High speed imaging of electrophotographic film by fine beam scanning. 4,468,707, Cl. 358-300.000.

Kuemmel, Robert, to August Krempel Soehne GmbH & Co. Thermosetting resin masses based upon aminoplast. 4,468,504, Cl. 525-406.000.

Kuhlman Corporation: *See*—
Haagen, Darl E.; and Eyre, David L., 4,468,058, Cl. 292-144.000.

Kuhn, A. Kenneth. Card game using transparent playing cards with opaque indicia. 4,468,037, Cl. 273-295.000.

Kulesza, Ralph J.; Kulesza, Wayne A.; Arias, Henry; and Disko, Harry, to Marvin Glass & Associates. Portable pneumatic action game. 4,468,029, Cl. 273-108.000.

Kulesza, Wayne A.: *See*—
Kulesza, Ralph J.; Kulesza, Wayne A.; Arias, Henry; and Disko, Harry, 4,468,029, Cl. 273-108.000.

Kulite Semiconductor Products, Inc.: *See*—
Mallon, Joseph R.; and Kurtz, Anthony D., 4,467,656, Cl. 73-727.000.

Kumagai, Masahiko: *See*—
Matsui, Sigeo; Tukahara, Yogo; Hayashi, Shigeki; and Kumagai, Masahiko, 4,468,238, Cl. 55-26.000.

Kumamoto, Shoichiro, to Chlorella Industry Co., Ltd. Method of human cell culture. 4,468,460, Cl. 435-240.000.

Kuna, Wayne A.; and Wildman, John R., to Marvin Glass & Associates. Shiftable drive self-propelled toy vehicle. 4,467,557, Cl. 446-463.000.

Kung, Roger I.; Spitz, Jonathan N.; and Flannagan, Stephen T., to Intel Corporation. Testing method and apparatus for dram. 4,468,759, Cl. 365-201.000.

Kupcikevicius, Vytautas: *See*—
Beckman, John H.; Haettinger, George C.; and Kupcikevicius, Vytautas, 4,467,499, Cl. 17-49.000.

Kupferschmidt, Wolfgang: *See*—
Manusch, Christoph; and Kupferschmidt, Wolfgang, 4,468,147, Cl. 401-292.000.

Kuraray Co., Ltd.: *See*—
Fumio, Mori; Toshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, 4,468,521, Cl. 560-124.000.

Kurata, Noboru: *See*—
Asaka, Urataro; Kurata, Noboru; and Masumura, Masanori, 4,467,751, Cl. 123-190.00E.

Kurata, Takeshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Tool changer for facing head. 4,467,517, Cl. 29-568.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.

Kuromoto, Kazunori, to Kabushiki Kaisha Komatsu Seisakusho. Control means for a mechanical finger clamp. 4,468,162, Cl. 414-4.000.

Kurschner, Dennis L.: *See*—
Braunling, Russell D.; and Kurschner, Dennis L., 4,468,763, Cl. 367-136.000.

Kurth, Josef: *See*—
Gauchel, Peter; and Kurth, Josef, 4,468,369, Cl. 264-560.000.

Kurtz, Anthony D.: *See*—
Mallon, Joseph R.; and Kurtz, Anthony D., 4,467,656, Cl. 73-727.000.

Kurtz, John B.: *See*—
Peacock, Jonathan H. B.; and Kurtz, John B., 4,468,332, Cl. 210-755.000.

Kurtz, Leonard D.; and LiCausi, Joseph M., to BioResearch Inc. Surgical drainage apparatus with incremental suction control and indication. 4,468,226, Cl. 604-321.000.

Kurz, Milton. Two bar warp-knitted loop fabric. 4,467,625, Cl. 66-193.000.

Kurz, Wolf-Dieter: *See*—
Braatz, Andreas; Weintz, Johann; and Kurz, Wolf-Dieter, 4,467,747, Cl. 123-41.120.

Kuschmierz, Heinz: *See*—
Kampichler, Gunter; Kuschmierz, Heinz; and Schenk, Bernhard, 4,467,767, Cl. 123-467.000.

Kusek, Roger: *See*—
Postlethwait, James H.; Olashaw, William F.; and Kusek, Roger, 4,468,531, Cl. 200-50.0AA.

Kuttner, Thomas: *See*—
Buck, Rainer; Kuttner, Thomas; and Wessel, Wolf, 4,467,775, Cl. 123-571.000.

Kuwabara, Kouji: *See*—
Takemori, Satoshi; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,468,777, Cl. 372-107.000.

Kuwana, Noriaki: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, 4,468,458, Cl. 435-134.000.

Kuzmick, Kenneth M.; and Anspach, William E., Jr. Surgical suction tip with filter. 4,468,217, Cl. 604-48.000.

Kyriakos, Constantinos S., to Bendix Corporation, The. Linear sweep frequency modulator for FM/CW radio altimeter. 4,468,638, Cl. 331-178.000.

Laakso, Oliver A. Stationary diffuser. 4,468,319, Cl. 210-97.000.

LaBate, Micheal D. Device for placing slag retention devices in tapping converters. 4,468,013, Cl. 266-272.000.

Laclede Professional Products, Inc.: *See*—
Pellico, Michael A., 4,468,484, Cl. 523-109.000.

Lacrex Brevetti S.A.: *See*—
Pasbrig, Max, 4,467,827, Cl. 137-197.000.

Ladygina, Natta T., administrator: *See*—
Kreinin, Efim V.; Smolkov, Anatoly N.; Iliin, Valentin A.; and Golykh, Vladimir T., deceased, 4,467,779, Cl. 126-91.00A.

Lai, Ching C.: *See*—
King, Harold B.; Lai, Ching C.; and Walker, Edward S., 4,468,163, Cl. 414-21.000.

Lamy, Jacques E.; and de Asis Manuel Serrano, Francisco, to Compagnie Generale pour les Developpements Operationnels des Richesses sous-Marines "C.G. Doris". Icebreaker system for marine platforms. 4,468,152, Cl. 405-61.000.

Lamy, Jean-Michel, to Regie Nationale des Usines Renault. Transmission differential. 4,467,672, Cl. 74-713.000.

Landshuter Baueisenbiegerei GMBH: *See*—
Hasak, Wilhelm, 4,467,583, Cl. 52-653.000.

Lange, Henry J., to Deere & Company. Vibration dampener on engine shaft. 4,467,753, Cl. 123-195.00A.

Langerbeck, Fritz, to Kjessler & Mannerstrale AB. Container for an industry hall. 4,467,573, Cl. 52-79.500.

Langford, Cooper A.; Jones, John; and Riddell, William D. Chemical heat storage. 4,467,785, Cl. 126-400.000.

Langham, Ronald F., to Baker Oil Tools, Inc. Fluid pressure actuator for subterranean well apparatus. 4,467,870, Cl. 166-321.000.

Langner, Guenther O.: *See*—
Blair, William W.; Doran, Samuel K.; and Langner, Guenther O., 4,468,565, Cl. 250-491.100.

Lanier Business Products, Inc.: *See*—
Plunkett, Luther C., Jr., 4,468,751, Cl. 364-900.000.

Lanier, Charles S.; Maxwell, Hiram M.; McKay, Roger E.; and Weiss, Leonard, to International Business Machines Corporation. Method of purging erroneous signals from closed ring data communication networks capable of repeatedly circulating such signals. 4,468,734, Cl. 364-200.000.

Lao, Kenneth Q. H., to Nimslo International Limited. Travelling lamp house for 3-D photographic printer. 4,468,115, Cl. 355-22.000.

Larsen, Hugh G.: *See*—
Leavitt, Steven C.; Larsen, Hugh G.; and Hunt, Barry F., 4,468,747, Cl. 364-577.000.

Larsen, Lars G.: *See*—
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larsen, Lars G., 4,468,187, Cl. 425-363.000.

Larsson, Lars-Ake: *See*—
Shaldon, Stanley; Gullberg, Claes-Ake; and Larsson, Lars-Ake, 4,468,329, Cl. 210-651.000.

Laurel Bank Machine Co. Ltd.: *See*—
Kokubo, Eiichi; Goi, Koichi; Arikawa, Junichi; Ebihara, Hideyuki; and Chiba, Hiroshi, 4,468,068, Cl. 312-333.000.

Lauterbach-Dammler, Inge: *See*—
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Margraf, Adolf. Filtering separators having filter cleaning apparatus. 4,468,240, Cl. 55-290.000.
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Tanaka, Kazuyuki, 4,468,662, Cl. 340-789.000.
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Akutsu, Hidezoh; and Ogata, Yoshiro, 4,468,590, Cl. 313-573.000.
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Mattheiss, Eugen: *See*—
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., 4,467,877, Cl. 173-12.000.
Matthiessen, Bernd: *See*—
Harms, Margret; Luthje, Holger; and Matthiessen, Bernd, 4,468,799, Cl. 378-35.000.
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Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,467,855, Cl. 164-7.100.
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Maubach, Gerd; and Vogel, Franz-Gunter. Ladder-guided service elevator. 4,467,889, Cl. 182-103.000.
Maul Technology Corporation: *See*—
Newkirk, Mark C., 4,467,683, Cl. 83-54.000.
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Maurer Engineering Inc.: *See*—
Nagel, Dave D., 4,468,138, Cl. 384-303.000.
Maxwell, Hiram M.: *See*—
Lanier, Charles S.; Maxwell, Hiram M.; McKay, Roger E.; and Weiss, Leonard, 4,468,734, Cl. 364-200.000.
Mayfield, William B., to Parker-Hannifin Corporation. Medication infusion pump. 4,468,221, Cl. 604-152.000.
Mazin, Moshe: *See*—
Engeler, William E.; and Mazin, Moshe, 4,468,574, Cl. 307-451.000.
Mazzoni, Guido, to Costruzioni Meccaniche G. Mazzoni S.p.A. High efficiency screw feeders for continuous extrusion and refining of soaps, detergents and other similar plastic products. 4,468,126, Cl. 366-87.000.
McAdams, Luther J., Sr. Anti-theft mechanism for removable automobile roof panel. 4,468,064, Cl. 296-224.000.
McBride, James W., to Fabrik, Inc. Method of making a dinnerware article. 4,468,419, Cl. 427-266.000.
McCain, George R.; and Blaetz, Philip H., to Kraft, Inc. Retort pouch thermal simulator and method of optimizing heat transfer in retort conditions. 4,468,135, Cl. 374-44.000.
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McCallum, Bruce D.; and McCallum, Scott J., 4,467,890, Cl. 182-206.000.
McClanahan, Edwin D.: *See*—
Patten, James W.; Moss, Ronald W.; and McClanahan, Edwin D., 4,468,437, Cl. 428-553.000.
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Meyer, Max F., Jr.; and McConnell, Richard L., 4,468,490, Cl. 524-311.000.
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Siener, Philip R., Jr.; and McCusker, Joseph H., 4,468,422, Cl. 428-57.000.
McCutchan, Ben O., Jr., to Dyneer Corporation. Composite plastic pulley. 4,468,210, Cl. 474-170.000.
McDonnell, Damien G.: *See*—
Hilsum, Cyril; and McDonnell, Damien G., 4,468,137, Cl. 374-160.000.
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McElreath, Kenneth W., to Rockwell International Corporation. Aircraft indicator capable of operation in HSI mode or CDI mode. 4,467,643, Cl. 73-178.00R.
McEwen, Stephen N.; Stevens, Robert L.; Benschoter, Barry R.; and Benschoter, Robert F., to Henry Filters, Inc. Trough, manufacturing process, and apparatus. 4,467,633, Cl. 72-203.000.
McGaffigan, Thomas H.: *See*—
Hine, Jean P.; and McGaffigan, Thomas H., 4,468,076, Cl. 339-75.00M.
McGhie, James R.; and Fishgal, Semyon I., to American Hoist of Canada Limited. Steering assembly for towed vehicles. 4,468,047, Cl. 280-419.000.
McGill Incorporated: *See*—
Lawrence, Gary N.; and Wilburg, Jerry D., 4,468,193, Cl. 431-89.000.
McIntosh, George C.; Everdyke, Jonathan C.; and Schutte, Marlin D., to General Signal Corp. Solids mixing apparatus. 4,468,129, Cl. 366-213.000.
McKay, Roger E.: *See*—
Lanier, Charles S.; Maxwell, Hiram M.; McKay, Roger E.; and Weiss, Leonard, 4,468,734, Cl. 364-200.000.
McKeny, Stanley T., executor: *See*—
Meginnis, Charles E., deceased, 4,468,095, Cl. 350-319.000.
McLellan, Edward J., to United States of America, Energy. Reinjection laser oscillator and method. 4,468,776, Cl. 372-93.000.
McMahon, Ronald G.; and Hale, Donnie E., to Contitronix, Inc. Detachable carriage assembly for printer. 4,468,144, Cl. 400-354.000.
McMeeking, John: *See*—
Caunt, Anthony D.; Gavens, Paul D.; and McMeeking, John, 4,468,477, Cl. 502-104.000.
McMillan, Robert D., Jr. Turbine wheel flow measuring transducer. 4,467,660, Cl. 73-861.870.

McMillin Wire & Plating, Inc.: *See*—
Stroh, Alvin L., 4,467,989, Cl. 248-97.000.
McNab, Ian R.; and Kemeny, George A., to Westinghouse Electric Corp. Electromagnetic projectile launcher with combination plasma/conductor armature. 4,467,696, Cl. 89-8.000.
McNicholas, James J., to MGI International, Inc. Centrifugal separator. 4,468,234, Cl. 55-1.000.
McWhorter, Edward M. Partially constrained five-bar mechanism for reciprocating piston engines. 4,467,756, Cl. 123-197.0AC.
Meal, John R.; and Wiklund, Gordon M., to AT&T Technologies, Inc. Contactor for impressing electrical potential from a shaft to a roller mounted thereon. 4,468,069, Cl. 339-6.00A.
Meckel, Joachim: *See*—
Galow, Manfred; Flockenhaus, Claus; Meckel, Joachim; Joseph, Horst G.; and Gabriel, Gunter, 4,468,288, Cl. 201-41.000.
Meckler, Milton. Eye medication dispensing frames and insert. 4,468,103, Cl. 351-158.000.
Medtronic, Inc.: *See*—
Bornzin, Gene A., 4,467,807, Cl. 128-419.0PG.
Zytkovicz, Duane J., 4,467,800, Cl. 128-303.00R.
Meginnis, Charles E., deceased (by McKeny, Stanley T., executor), to Pressure Products Company, Inc. Sight glass assembly. 4,468,095, Cl. 350-319.000.
Megy, Joseph A., to Occidental Research Corporation. Process for making titanium metal from titanium ore. 4,468,248, Cl. 75-84.400.
Meier, Eugen, to Mettler Instrumente AG. Weighing apparatus including parallel guidance members having integral guide arms. 4,467,883, Cl. 177-210.0FP.
Meier, Jurgen: *See*—
Janssen, Klaus; Meier, Jurgen; and Frank, Siegfried, 4,468,154, Cl. 405-128.000.
Meiji Seika Kaisha Ltd.: *See*—
Oiso, Hisayoshi; and Joyama, Norio, 4,467,711, Cl. 99-577.000.
Melling, Robert J.: *See*—
Aldous, Derek R.; and Melling, Robert J., 4,467,726, Cl. 104-246.000.
Membrino, Hercules. Bag pad binder. 4,468,276, Cl. 156-510.000.
Menager, Henry: *See*—
le Faou, Daniel; and Menager, Henry, 4,468,049, Cl. 280-634.000.
Meneghini, Frank A.; and Palumbo, Paul S., to Polaroid Corporation. Photographic products and processes. 4,468,450, Cl. 430-222.000.
Meneghini, Frank A.: *See*—
Arbree, Roberta R.; Foley, James W.; and Meneghini, Frank A., 4,468,449, Cl. 430-222.000.
Merlin Gerin: *See*—
Gerbert-Gaillard, Alain; and Morel, Robert, 4,468,645, Cl. 335-42.000.
Messerschmitt-Boelkow-Blohm GmbH: *See*—
Peikert, Jurgen, 4,467,600, Cl. 60-204.000.
Metcalf, Eric; and Jeffery, Michael C., to Sangamo Weston Limited. Data receivers incorporating error code detection and decoding. 4,468,770, Cl. 371-42.000.
Mettler Instrumente AG: *See*—
Meier, Eugen, 4,467,883, Cl. 177-210.0FP.
Metzroth, Douglas J., to Chemetron Process Equipment, Inc. Method for the continuous production of confections. 4,468,409, Cl. 426-659.000.
Meyer, Danny S.: *See*—
Le, Tri C.; Meyer, Danny S.; and Williams, John B., 4,468,039, Cl. 277-112.000.
Meyer, Hans R.: *See*—
Luthi, Christian; Meyer, Hans R.; and Weber, Kurt, 4,468,352, Cl. 260-459.00A.
Meyer, Max F., Jr.; and McConnell, Richard L., to Eastman Kodak Company. Adhesive compositions. 4,468,490, Cl. 524-311.000.
Meyer, Yves H.; and Nentchev, Marin N., to Centre National de la Recherche Scientifique; and Institut Po Electronica PRI Ban Sofia. Optical selector device using a Fizeau wedge for reflection. 4,468,775, Cl. 372-92.000.
Mezger, Manfred; Pfaff, Georg; and Seeger, Karl, to Robert Bosch GmbH. Dwell period control for engine ignition. 4,467,776, Cl. 123-609.000.
MGI International, Inc.: *See*—
McNicholas, James J., 4,468,234, Cl. 55-1.000.
Michel, Helmut; Kampe, Wolfgang; Ofenloch, Roland; Dietmann, Karl; and Sponer, Gisbert, to Boehringer Mannheim GmbH. 3-Cyano-indoles as cardioselective agents. 4,468,520, Cl. 424-274.000.
Microbo, S.A.: *See*—
Monnier, Jean-Luc; and Robert, Francis, 4,468,666, Cl. 340-870.290.
Midland, Richard W., to Zenith Electronics Corporation. Beam index color display system. 4,468,690, Cl. 358-67.000.
Miessler, James D., to Versar Inc. Internal mold gating method and apparatus. 4,468,363, Cl. 264-128.000.
Mikami, Takeshi; and Hosoi, Noriyuki, to Fuji Photo Film Co., Ltd. Electrostatographic encapsulated toner material improved in powder characteristics. 4,468,446, Cl. 430-138.000.
Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Automatic weighing apparatus. 4,467,882, Cl. 177-58.000.
Mikkelson, Karen A.: *See*—
Butler, James R.; Watson, James M.; Kendall, Debra L.; and Mikkelson, Karen A., 4,468,343, Cl. 252-403.000.
Milan, Lucien R.; and Gousseau, Roland R., to U.S. Philips Corporation. Device for coupling two optical fibers. 4,468,087, Cl. 350-96.180.
Miles Laboratories, Inc.: *See*—
Atkinson, David C.; Carrico, Robert J.; and Morris, David L., 4,468,469, Cl. 436-500.000.
Miller, Bertram W. Method and apparatus for ascertaining color balance of photographic printing paper. 4,468,123, Cl. 356-404.000.
Miller, Cecil V.; and Miller, Erma M. Pump means and coupling means for evaporative cooler. 4,468,357, Cl. 261-29.000.
Miller, Erma M.: *See*—
Miller, Cecil V.; and Miller, Erma M., 4,468,357, Cl. 261-29.000.
Miller, Ivan: *See*—
Shaffer, Charles D.; and Miller, Ivan, 4,467,823, Cl. 137-15.000.
Miller, Robert C.: *See*—
Carr, Walter J., Jr.; and Miller, Robert C., 4,468,568, Cl. 290-1.00R.
Miller, Wendell E.: *See*—
Ellingson, Gary L.; and Miller, Wendell E., 4,468,671, Cl. 343-766.000.
Milliken Research Corporation: *See*—
Eschenbach, Paul W., 4,467,594, Cl. 57-207.000.
Willbanks, Charles E., 4,468,220, Cl. 604-133.000.
Mills, Thomas O. Machine for cutting rounded corner notches. 4,467,850, Cl. 144-368.000.
Mimura, Yoshiki, to Ushio Denki Kabushiki Kaisha. Uniform wafer heating by controlling light source and circumferential heating of wafer. 4,468,259, Cl. 148-1.500.
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, to Adeka Argus Chemical Co., Ltd. Poly(piperidylamine) alkanes and synthetic resin compositions stabilized thereby. 4,468,488, Cl. 524-99.000.
Minagawa, Yoshinori; and Miyaguchi, Katsuhiko, to Terumo Kabushiki Kaisha. Syringe. 4,468,223, Cl. 604-199.000.
Minami, Hideki: *See*—
Morimura, Hiroaki; Minami, Hideki; and Kanai, Shunichiro, 4,467,992, Cl. 268-659.000.
Minami, Koichi; and Nishimiya, Tohru, to Tomy Kogyo Co., Inc. Object transfer toy utilizing gears for component coordination. 4,468,033, Cl. 273-153.00S.
Minamida, Kazukiyo; and Fujitani, Yugo, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus. 4,467,880, Cl. 177-25.000.
Minemura, Norihiro: *See*—
Sekimoto, Masaaki; Minemura, Norihiro; Suzuki, Togi; and Tsunawaki, Kiyokazu, 4,468,434, Cl. 428-372.000.
Miner, Thomas G.: *See*—
Callahan, Francis M.; Miner, Thomas G.; and Bernstein, Seymour, 4,468,385, Cl. 424-180.000.
Ministry of International Trade and Industry of Japan: *See*—
Yoshiwa, Masao; Hujioka, Yoshiro; Tokai, Masakuni; and Muro, Mikio, 4,467,958, Cl. 237-2.00B.
Minneman, William J. Container for cylindrical objects. 4,467,947, Cl. 224-253.000.
Minnesota Mining and Manufacturing Company: *See*—
Licht, Richard R., 4,467,577, Cl. 52-232.000.
Patel, Kalyanji U., 4,468,527, Cl. 564-96.000.
Miser, H. T.: *See*—
Pippert, Aaron J.; and Miser, H. T., 4,468,042, Cl. 277-188.00A.
Misra, Chanakya, to Aluminum Company of America. Production of alumina from aluminum-containing mineral ores with sodium bicarbonate. 4,468,375, Cl. 423-122.000.
Mita Industrial Company Limited: *See*—
Yamagata, Ryutaro; Kozuka, Nobuhiko; Nishihama, Hitoshi; Koyama, Shigeo; and Sakai, Kazutada, 4,468,111, Cl. 355-3.0DD.
Mitra, Arun K.; and Flynn, Robert G., to Norcliff Thayer, Inc. Concentrated magnesium hydroxide preparations. 4,468,381, Cl. 424-158.000.
Mitsubishi Chemical Industries Ltd.: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Omokawa, Hiroyoshi; Yoneyama, Koichi; Ushinohama, Kazuyuki; and Suzuki, Seiichi, 4,468,245, Cl. 71-88.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Genba, Yasushi; Tamaru, Shigemi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,081, Cl. 339-176.00M.
Kitauchi, Hajime, 4,467,616, Cl. 62-175.000.
Kodera, Toshihiko; Eguchi, Kiyoshi; Ishikawa, Takayoshi; Genba, Yasushi; Tamaru, Shigemi; and Satou, Susumu, 4,468,533, Cl. 200-153.0SC.
Miura, Azusa; Kambara, Kesao; Kinoshita, Takashi; Suzuki, Toshio; and Yonehata, Yuzuru, 4,468,572, Cl. 307-69.000.
Sasaki, Toshihiko, 4,467,648, Cl. 73-432.00R.
Tamaru, Shigemi; Genba, Yasushi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,082, Cl. 339-176.00M.
Yasuoka, Hirotoshi, 4,468,070, Cl. 339-7.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Fujiwara, Haruyoshi; and Kzdota, Yuji, 4,467,536, Cl. 34-116.000.
Irie, Nobuhiko, 4,468,267, Cl. 156-132.000.
Kurata, Takeshi, 4,467,517, Cl. 29-568.000.
Mitsubishi Kasai Kogyo Kabushiki Kaisha: *See*—
Muramatsu, Kozo; Hirai, Masanori; Sugihara, Saburo; and Nakamura, Hirozumi, 4,468,289, Cl. 204-1.00T.
Mitsubishi Mining & Cement Company, Ltd.: *See*—
Kashima, Masao; and Miyashita, Yasuo, 4,468,471, Cl. 501-135.000.
Kashima, Masao; and Miyashita, Yasuo, 4,468,472, Cl. 501-137.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Inoue, Masao; and Suzuki, Shingo, 4,468,092, Cl. 350-128.000.
Mitsuboshi Belting Ltd.: *See*—
Hoshiro, Takeshi; and Kanamori, Katsuo, 4,468,211, Cl. 474-205.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Kaneko, Masahiro; Asanuma, Tadashi; Uchikawa, Nobutaka; Fujio, Ichiro; and Shiomura, Tetsunosuke, 4,468,257, Cl. 134-22.130.

Mitsuyoshi, Toru; and Uchida, Yasuyuki, to Hiroyuki Kanai. Raising machine for producing suede tone finish with diamond-shape crosssection wires on the counter pile rollers. 4,467,505, Cl. 26-33.000.

Mittal, Faquir C.: *See*—
Mathias, Joseph S.; and Mittal, Faquir C., 4,468,717, Cl. 361-382.000.

Miura, Azusa; Kambara, Kesao; Kinoshita, Takashi; Suzuki, Toshio; and Yonehata, Yuzuru, to Japanese National Railways; and Mitsubishi Denki Kabushiki Kaisha. Feeder voltage compensating apparatus for electric railway. 4,468,572, Cl. 307-69.000.

Miyaguchi, Katsuhiko: *See*—
Minagawa, Yoshinori; and Miyaguchi, Katsuhiko, 4,468,223, Cl. 604-199.000.

Miyasaka, Eiji, to Dainippon Screen Seizo Kabushiki Kaisha. Process camera for printing pictures of different sizes in the desired display positions. 4,468,116, Cl. 355-54.000.

Miyashita, Takao: *See*—
Sone, Masazumi; Hirota, Yukitsugu; Miyashita, Takao; and Igawa, Tatsuo, 4,468,543, Cl. 200-19.0DR.

Miyashita, Tsuneo: *See*—
Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; Miyashita, Tsuneo; and Nakayama, Michio, 4,468,253, Cl. 106-97.000.

Miyashita, Yasuo: *See*—
Kashima, Masao; and Miyashita, Yasuo, 4,468,471, Cl. 501-135.000.
Kashima, Masao; and Miyashita, Yasuo, 4,468,472, Cl. 501-137.000.

Miyata, Hiroyasu; Watanabe, Keizo; and Yamaguchi, Akio, to Sanshin Electric Co., Ltd. Release mechanism for a push-button tuner. 4,467,671, Cl. 74-10.850.

Miyata, Masayoshi: *See*—
Ishida, Shinya; and Miyata, Masayoshi, 4,468,660, Cl. 340-764.000.

Mizoguchi, Toshimi: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Mizuguchi, Ryuzo: *See*—
Ishikura, Shinichi; Kanda, Kazunori; Kida, Katsuaki; and Mizuguchi, Ryuzo, 4,468,493, Cl. 525-123.000.

Mizuno, Nobutaka: *See*—
Matushiro, Ryuichi; Moriguchi, Koichi; Iwamoto, Kenzi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,467,608, Cl. 60-602.000.

Mobay Chemical Corporation: *See*—
Thomas, Thomas J.; Hoguet, Robert G.; Sandefur, Charles W.; and Kalz, Dietmar, 4,468,230, Cl. 8-528.000.

Mobil Oil Corporation: *See*—
Chen, Catherine S. H.; and Williams, Albert L., 4,468,335, Cl. 252-8.55D.
Chen, Catherine S. H., 4,468,342, Cl. 252-353.000.
Givens, Wyatt W., 4,467,642, Cl. 73-152.000.
Kuehl, Guenter H., 4,468,475, Cl. 502-71.000.
Osborn, Paul V., 4,467,506, Cl. 28-102.000.

Mochizuki, Kazuo: *See*—
Ban, Tenji; Mochizuki, Kazuo; Sakamoto, Yasuhei; and Harada, Shunichi, 4,468,292, Cl. 204-27.000.

Modes, Edward E. Expander tool. 4,467,512, Cl. 29-237.000.

Molders, Werner; Freitag, Herbert; and Smith, Lawther O., to Stabilus GmbH. Cylinder-piston device. 4,467,899, Cl. 188-320.000.

Molloy, Richard P., deceased: *See*—
Blanchard, Russell O.; Wolff, Douglas F.; Steele, Charles E.; and Molloy, Richard P., deceased, 4,467,569, Cl. 52-9.000.

Molloy, Vera C., heir and legal representative: *See*—
Blanchard, Russell O.; Wolff, Douglas F.; Steele, Charles E.; and Molloy, Richard P., deceased, 4,467,569, Cl. 52-9.000.

Momosaki, Eishi: *See*—
Takagi, Michiaki; and Momosaki, Eishi, 4,468,634, Cl. 331-60.000.

Monell Chemical Senses Center: *See*—
Preti, George, 4,467,814, Cl. 128-738.000.

Monkeberg, Karlheinz: *See*—
Exner, Gunter; and Monkeberg, Karlheinz, 4,468,361, Cl. 264-119.000.

Monnier, Jean-Luc; and Robert, Francis, to Microbo, S.A. Apparatus for determining a reference position of a moving member. 4,468,666, Cl. 340-870.290.

Monsanto Company: *See*—
Malon, Raymond F.; and Zampini, Anthony, 4,468,500, Cl. 525-390.000.
Malon, Raymond F.; and Zampini, Anthony, 4,468,502, Cl. 525-390.000.
Zampini, Anthony; and Malon, Raymond F., 4,468,501, Cl. 525-390.000.
Zampini, Anthony; and Malon, Raymond F., 4,468,503, Cl. 525-390.000.

Monster Cable Products, Inc.: *See*—
Lee, Noel; and Choy, Andrew L., 4,468,083, Cl. 339-252.00P.

Montagnan, Jean-Daniel, to Soletanche. Component to be employed in the constructiion of walls poured in the ground, wall incorporating such a component, and method of constructing such a wall. 4,467,587, Cl. 52-169.140.

Montana, Frank J., to Bisco Products, Inc. Flue gas duct assembly. 4,467,863, Cl. 165-136.000.

Montedison S.p.A.: *See*—
Colle, Roberto; Gozzo, Franco; and Preziuso, Ciro, 4,468,243, Cl. 71-88.000.

Monterey Manufacturing Co.: *See*—
Hall, Charles P., 4,467,485, Cl. 5-450.000.

Montgomery, John R., to Constantin Systems, Inc. Opaque projector. 4,468,105, Cl. 353-66.000.

Montgomery, Robert L.: *See*—
Nelson, John L.; Montgomery, Robert L.; and Buist, Richard J., 4,467,611, Cl. 62-3.000.

Monticelli, Dennis M., to National Semiconductor Corporation. Low temperature coefficient wide band-width voltage controlled oscillator. 4,468,636, Cl. 331-113.00R.

Mookherjee, Braja D.: *See*—
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,467,820, Cl. 131-276.000.

Moore, M. Samuel, to Semco Instruments, Inc. Turboran speed limiting control system. 4,467,599, Cl. 60-39.093.

Morcheles, Bernard I., to Stacor Corporation. Movable aisle storage system. 4,467,924, Cl. 211-1.500.

Morel, Robert: *See*—
Gerbert-Gaillard, Alain; and Morel, Robert, 4,468,645, Cl. 335-42.000.

Moreno, Robert J.: *See*—
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,468,730, Cl. 364-200.000.

Morgan, Annis R., Jr.; and King, Eddie W., to Coca-Cola Company, The. Energy management system for chilled product vending machine. 4,467,617, Cl. 62-180.000.

Mori, Keiji: *See*—
Yukimoto, Kazuyoshi; Mori, Keiji; and Masuda, Mitsuyoshi, 4,468,063, Cl. 296-223.000.

Mori, Kenji, to Hitachi, Ltd. Piezoelectric rotary actuator. 4,468,583, Cl. 310-328.000.

Mori, Shinji; and Tamura, Keiichi, to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho. Webbing retractor. 4,467,981, Cl. 242-107.40A.

Mori, Shunji; Yamada, Hiromitsu; Takeuchi, Kunihiko; and Do, Michihisa, to Agency of Industrial Science and Technology; Tokyo Keiki Co., & Ltd.; and Totec Co., Ltd. Feature extraction system for digitized character information. 4,468,808, Cl. 382-20.000.

Mori, Toshihito: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hizakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Moriconi, Emil: *See*—
Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, 4,468,347, Cl. 260-147.000.

Moriguchi, Koichi: *See*—
Matushiro, Ryuichi; Moriguchi, Koichi; Iwamoto, Kenzi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,467,608, Cl. 60-602.000.

Morimoto, Takeshi: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Matsubara, Toshiya, 4,468,301, Cl. 204-98.000.

Morimoto, Yoshiro: *See*—
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Fuiagi, Masaaki; and Suzuki, Tadashi, 4,467,673, Cl. 74-860.000.

Morimura, Hiroaki; Minami, Hideki; and Kanai, Shunichiro, to Nissan Motor Company, Limited. Power-unit mounting structure for automotive vehicle. 4,467,992, Cl. 248-659.000.

Morinaga, Hisao: *See*—
Asada, Atsushi; Morinaga, Hisao; and Saiji, Mitsuhiro, 4,468,754, Cl. 364-900.000.

Morioka, Takayuki: *See*—
Oka, Toshihisa; Nakanishi, Hiroaki; Takamatsu, Ryoichi; Morioka, Takayuki; Okada, Masakazu; Hara, Hideyuki; and Kasashima, Hirokazu, 4,468,733, Cl. 364-200.000.

Morishita, Teru; Ohtawa, Satoshi; Ishioka, Yoshimichi; and Suzuki, Toshikazu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,467,968, Cl. 239-703.000.

Morley, John D., to Advanced Technologies, Inc. Method of applying hard surfaces to gate valves and the like. 4,468,552, Cl. 219-121.0EC.

Morrell, Robert F., Jr., to Senco Products, Inc. Latch assembly for the front gate of the guide body of an industrial fastener driving tool. 4,467,952, Cl. 227-123.000.

Morris, David L.: *See*—
Atkinson, David C.; Carrico, Robert J.; and Morris, David L., 4,468,469, Cl. 436-500.000.

Morris, John C.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Polyesters of trans-4,4'-stilbenedicarboxylic acid, terephthalic acid or 2,6-naphthalenedicarboxylic acid, 1,2-propanediol and 1,3-propanediol. 4,468,510, Cl. 528-298.000.

Morrison, Terry, to Chandler Evans, Inc. Gas turbine engine power availability measurement. 4,467,640, Cl. 73-117.300.

Morrissey, James H., to United States of America, Health and Human Services. Silver stains for protein in gels—a modified procedure. 4,468,466, Cl. 436-86.000.

Moser, Helmut: *See*—
Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, 4,468,347, Cl. 260-147.000.

Moss, Ronald W.: *See*—
Patten, James W.; Moss, Ronald W.; and McClanahan, Edwin D., 4,468,437, Cl. 428-553.000.

Motohashi, Mitsuo; and Nemoto, Mitsugu, to Konishiroku Photo Industry Co., Ltd. Transfer type electrostatic reproducing apparatus. 4,468,113, Cl. 355-14.0TR.

Motorola, Inc.: *See*—
Burke, Timothy M.; Smith, Paul F.; Noble, Scott W.; and Schorman, Eric R., 4,468,813, Cl. 455-38.000.
Fitzgerald, Edward A.; and Pfeffer, Darrell A., 4,468,605, Cl. 320-36.000.
Sloan, James W.; Tran, Truoc T.; and Jones, Frank T., III, 4,468,411, Cl. 427-8.000.

MotorTech, Inc.: *See*—
Yunick, Henry, 4,467,752, Cl. 123-193.00P.

Moulin, Bernard: *See*—
Baumard, Rene ; Erckelboudt, Andre ; Moulin, Bernard; and Robin, Remi, 4,468,597, Cl. 318-317.000.

Moulinex, Societe Anonyme: *See*—
Amiot, Jacques H. J., 4,467,707, Cl. 99-279.000.

Moulton, Clifford H., to Palmguard, Inc. Method for analyzing stored image details. 4,468,807, Cl. 382-2.000.

Mowbray, Dorian F.: *See*—
Fenne, Ivor; and Mowbray, Dorian F., 4,468,179, Cl. 417-462.000.

Mueller, Eckart, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Fuel-injecting valve for internal combustion engine. 4,467,966, Cl. 239-533.400.

Mueller, Joseph H.; Dawson, Ronald G.; and Irwin, Samuel N., to Irwin International, Inc. Positioner apparatus for tape recorder heads. 4,468,712, Cl. 360-106.000.

Mueller, Richard, to American Hofmann Corporation. Apparatus for balancing rotatable bodies. 4,467,649, Cl. 73-462.000.

Muench, Volker: *See*—
Naarmann, Herbert; Muench, Volker; and Franz, Klaus-Dieter, 4,468,509, Cl. 526-284.000.

Muhlenbeck, Josef: *See*—
Bauer, Hanns G.; Zollner, Dieter H.; Otto, Josef; Muhlenbeck, Josef; Rittmann, Friedrich; Conradty, Claudio; Lauterbach-Dammler, Inge; and Sonke, Horst, 4,468,783, Cl. 373-93.000.

Munch, Helmut, to Klein, Schanzlin & Becker Aktiengesellschaft. Turbine driven pump. 4,468,176, Cl. 417-406.000.

Munch, Manfred, to Feldmuhle Aktiengesellschaft. Helical mandibular implant. 4,468,200, Cl. 433-174.000.

Munezawa, Kazushi; and Tsuru, Tashihiko, to Nippon Electric Co., Ltd. Television synchronizing signal reproducing apparatus. 4,468,687, Cl. 358-19.000.

Murakami, Akira: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Murakami, Kunio: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Sekiya, Tomozo; and Uenishi, Mituru, 4,468,432, Cl. 428-328.000.

Murakami, Shinichi; Sugitani, Junichi; and Yoshimoto, Teruo, to Kubota, Ltd.; and Osaka Gas Kabushiki Kaisha. Ultrasonic flaw detection of a pipe. 4,467,654, Cl. 73-640.000.

Muramatsu, Kozo; Hirai, Masanori; Sugihara, Saburo; and Nakamura, Hirozumi, to Mitsubishi Kassi Kogyo Kabushiki Kaisha. Coulometric titration method. 4,468,289, Cl. 204-1.00T.

Murase, Kazuyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Drying apparatus. 4,467,534, Cl. 34-82.000.

Muro, Mikio: *See*—
Yoshiwa, Masao; Hujioka, Yoshiro; Tokai, Masakuni; and Muro, Mikio, 4,467,958, Cl. 237-2.00B.

Murphree, A. Pat. Weir. 4,467,645, Cl. 73-215.000.

Murphy, John C.; and Aamodt, Leonard C., to Johns Hopkins University, The. Optical beam deflection thermal imaging. 4,468,136, Cl. 374-45.000.

Murphy, John R.: *See*—
Bacha, Patricia; Reichlin, Seymour; and Murphy, John R., 4,468,382, Cl. 424-177.000.

Musser, Glenn A.; McDuffie, James W.; Pucher, Richard A.; Redding, Lloyd W.; and Waldrop, T. William, to Sperry Corporation. Drive reversing mechanism. 4,467,590, Cl. 56-11.200.

Musser, Glenn A.; Swiler, Stuart O.; and Knepper, Larimer J., to Sperry Corporation. Combined stone trap closing mechanism. 4,467,819, Cl. 130-27.0JT.

Mustin, Frank H., to Fleer Corp. Playing board simulating an action game. 4,468,028, Cl. 273-85.00R.

Muto, Rudolph. Irrigation suction catheter. 4,468,216, Cl. 604-43.000.

Myers, Jerome J. Turning vane rail. 4,467,829, Cl. 137-561.00A.

Myrens Verksted A/S: *See*—
Johnsen, Oystein, 4,468,286, Cl. 162-17.000.

Naarmann, Herbert; Kohler, Gernot; and Schlag, Johannes, to BASF Aktiengesellschaft. Continuous production of polypyrrole films. 4,468,291, Cl. 204-13.000.

Naarmann, Herbert; Muench, Volker; and Franz, Klaus-Dieter, to BASF Aktiengesellschaft. Reversibly oxidizable or reducible polymers containing polyene units, their preparation and their use. 4,468,509, Cl. 526-284.000.

Nabisco Brands, Inc.: *See*—
Bosco, Peter M.; and Sledzieski, William L., 4,468,408, Cl. 426-604.000.

Nagasawa, Tsugio: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Sekiya, Tomozo; and Uenishi, Mituru, 4,468,432, Cl. 428-328.000.

Nagashima, Yoshitake, to Tokyo Shibaura Denki Kabushiki Kaisha. Color separation circuit. 4,468,689, Cl. 358-31.000.

Nagata, Mituo: *See*—
Kamiyama, Fumio; Kohara, Minoru; Nagata, Mituo; and Araki, Yasuhiko, 4,468,330, Cl. 210-656.000.

Nagatake, Hiroshi; and Hayashi, Keiji, to Nissan Motor Company, Limited; Achilles Corporation; and Ikeda Bussan Company, Limited. Pneumatic cushion and manufacturing method therefor. 4,467,484, Cl. 5-449.000.

Nagayama, Hirotsugu: *See*—
Kawahara, Hideo; Nagayama, Hirotsugu; and Honda, Hisao, 4,468,420, Cl. 427-397.700.

Nagel, Dave D., to Maurer Engineering Inc. Manufacture of diamond bearings. 4,468,138, Cl. 384-303.000.

Nakagawa, Kazuyuki: *See*—
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,468,402, Cl. 424-258.000.

Nakagawa, Makoto: *See*—
Hayashi, Masaharu; Nakagawa, Makoto; and Hattori, Kenji, 4,467,903, Cl. 192-58.00B.

Nakahara, Yutaka: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,468,488, Cl. 524-99.000.

Nakajima, Hisao; Kikuchi, Yoshiki; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Transfer type heat-sensitive printer. 4,468,676, Cl. 346-76.0PH.

Nakajima, Kenji: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, 4,468,458, Cl. 435-134.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.

Nakamura, Hirozumi: *See*—
Muramatsu, Kozo; Hirai, Masanori; Sugihara, Saburo; and Nakamura, Hirozumi, 4,468,289, Cl. 204-1.00T.

Nakamura, Naoji: *See*—
Masumoto, Hakaru; and Nakamura, Naoji, 4,468,370, Cl. 420-463.000.

Nakamura, Norihiko, to Rhythm Watch Co., Ltd. Whole body swingable clock. 4,468,132, Cl. 368-76.000.

Nakamura, Shigeru; Ono, Shigetoshi; Suzuki, Seiji; and Suzuki, Hirohisa, to Fuji Photo Film Company, Limited. Color diffusion transfer photographic elements. 4,468,452, Cl. 430-223.000.

Nakamura, Shohei; and Kinoshita, Nobuyasu, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry process for forming an image. 4,468,453, Cl. 430-269.000.

Nakamura, Takayoshi, to Kabushiki Kaisha Kito. Lever hoist. 4,468,005, Cl. 254-350.000.

Nakamura, Toshihiko: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.

Nakamura, Tutomu; and Koyama, Tamotsu, to Sharp Kabushiki Kaisha. Unidirectional flexure type tuning fork crystal vibrator. 4,468,584, Cl. 310-370.000.

Nakanishi, Hiroaki: *See*—
Oka, Toshihisa; Nakanishi, Hiroaki; Takamatsu, Ryoichi; Morioka, Takayuki; Okada, Masakazu; Hara, Hideyuki; and Kasashima, Hirokazu, 4,468,733, Cl. 364-200.000.

Nakata, Shinichi, to Canon Kabushiki Kaisha. Paper feed device for printer. 4,467,949, Cl. 226-45.000.

Nakatsukasa, Walter M.: *See*—
Malin, Nancy E.; Fayerman, Jeffrey T.; Jones, Michael D.; Mabe, James A.; and Nakatsukasa, Walter M., 4,468,462, Cl. 435-253.000.

Nakayama, Masahito: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Nakayama, Michio: *See*—
Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; Miyashita, Tsuneo; and Nakayama, Michio, 4,468,253, Cl. 106-97.000.

Namba, Yuzuru; and Aoyagi, Kenichi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,467,760, Cl. 123-308.000.

Narendra, Patrenahalli M.: *See*—
Carrison, Craig L.; Joseph, James D.; and Narendra, Patrenahalli M., 4,468,727, Cl. 364-200.000.

Narukawa, Yasunori; and Iwabuchi, Mitsunobu, to Hitachi Denshi Kabushiki Kaisha. Wide-band amplifier for driving capacitive load. 4,468,630, Cl. 330-267.000.

Nasfell, Jack W., Jr., to Wright Co. Inc., The. Holder for guitar plectra. 4,467,693, Cl. 84-329.000.

Nash, Ronald S.: *See*—
Lytton, Glenn E.; Fair, Jerry R.; and Nash, Ronald S., 4,467,502, Cl. 19-80.00R.

Nashimoto, Katsunori: *See*—
Kaneda, Hiroshi; Sato, Hiroshi; Nashimoto, Katsunori; and Matsui, Tadashi, 4,468,262, Cl. 148-156.000.

Nathan, Walter. Molded tray for display stands. 4,467,927, Cl. 211-153.000.

National Gypsum Company: *See*—
Sowinski, Gerard T., 4,467,580, Cl. 52-302.000.

National Research Development Corporation: *See*—
Hilsum, Cyril; and McDonnell, Damien G., 4,468,137, Cl. 374-160.000.
Hinshaw, Waldo S., 4,468,621, Cl. 324-309.000.

National Semiconductor Corporation: *See*—
Monticelli, Dennis M., 4,468,636, Cl. 331-113.00R.
National-Standard Company: *See*—
Cole, Leon J.; Mallory, Edwin E.; and Bourassa, Hugh, 4,468,266, Cl. 156-131.000.
Nautilus Environmentals, Inc.: *See*—
Saxon, Ross E.; and Bryant, W. Robert, 4,467,798, Cl. 128-205.260.
NCR Corporation: *See*—
Grabowski, John S.; and Tong, Aaron C. Y., 4,468,809, Cl. 382-50.000.
Necchi Societa per Azioni: *See*—
Perlino, Silvano, 4,467,736, Cl. 112-121.140.
Negi, Shigeto: *See*—
Machida, Yoshimasa; Saito, Isao; Sugiyama, Isao; Negi, Shigeto; Nomoto, Seiichiro; Ikuta, Hironori; Yamauchi, Hiroshi; and Kitoh, Kyosuke, 4,468,394, Cl. 424-246.000.
Neiheisel, Gary L., to Armco Inc. Laser treatment of electrical steel and optical scanning assembly therefor. 4,468,551, Cl. 219-121.00L.
Nel-Tech Development, Inc.: *See*—
Iwata, Hideki, 4,468,655, Cl. 340-518.000.
Nelenius, Eric: *See*—
Karlsson, Ingemar; Svensson, Percyval; Nelenius, Eric; Svensson, Goran; Ydrefors, Axel; and Lindstrom, Bengt, 4,467,950, Cl. 226-91.000.
Nelson, John L.; Montgomery, Robert L.; and Buist, Richard J., to Marlow Industries, Inc. Thermoelectric power generating device. 4,467,611, Cl. 62-3.000.
Nelson, Kenneth R.; and Allison, James R., to Schlage Lock Company. Bolt unit for a lockset. 4,468,059, Cl. 292-337.000.
Nelson, Norvell J., to Psi Star, Inc. Process for etching an aluminum-copper alloy. 4,468,284, Cl. 156-643.000.
Nemoto, Mitsugu: *See*—
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Nentchev, Marin N.: *See*—
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Neukermans, Armand P., to Hewlett-Packard Company. Method of making an electron beam window. 4,468,282, Cl. 156-633.000.
Nevitt, Thomas D., to Standard Oil Co (Indiana). Process for solvent extraction of vanadate and molybdate anions. 4,468,373, Cl. 423-54.000.
New England Medical Center, Inc.: *See*—
Bacha, Patricia; Reichlin, Seymour; and Murphy, John R., 4,468,382, Cl. 424-177.000.
Newkirk, Mark C., to Maul Technology Corporation. Shear mechanism for glass feeder. 4,467,683, Cl. 83-54.000.
Newland, Gordon C.: *See*—
Van Sickle, Dale E.; Newland, Gordon C.; Siirola, Jeffrey J.; and Cook, Steven L., 4,468,356, Cl. 260-544.00Y.
Ngo, Tuyen N. Oral temporary total hemostatic clamps. 4,467,803, Cl. 128-325.000.
Nguyen, Nghia V.: *See*—
Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., 4,468,743, Cl. 364-520.000.
Nibby, Chester M., Jr.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Salas, Edward R., 4,468,731, Cl. 364-200.000.
Nidola, Antonio: *See*—
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Niki, Shoji: *See*—
Takahashi, Toshiro; and Niki, Shoji, 4,468,614, Cl. 324-78.00D.
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larsen, Lars G., to PLM A.B. Apparatus for producing a tubular article having an annular groove therein. 4,468,187, Cl. 425-363.000.
Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,467,929, Cl. 215-1.00C.
Nimslo International Limited: *See*—
Lao, Kenneth Q. H., 4,468,115, Cl. 355-22.000.
Ninomiya, Masakazu: *See*—
Suzuki, Atsushi; Ninomiya, Masakazu; Fukaya, Hiroyasu; and Akiyama, Susumu, 4,467,765, Cl. 123-419.000.
Nippon Air Brake Co., Ltd.: *See*—
Kinoshita, Takao; and Onaka, Kazushige, 4,467,510, Cl. 29-157.10R.
Tamamori, Hideo, 4,467,832, Cl. 137-625.470.
Nippon Cable System, Inc.: *See*—
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Nippon Electric Co., Ltd.: *See*—
Munezawa, Kazushi; and Tsuru, Tashihiko, 4,468,687, Cl. 358-19.000.
Shimizu, Shigeaki; Kubo, Yoshimi; Suzuki, Tetsuo; Kizaki, Takashi; and Igarashi, Hitoshi, 4,468,719, Cl. 361-433.000.
Suga, Michihisa; and Tsuzuki, Mitsuo, 4,468,679, Cl. 346-140.00R.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Fushiki, Tatsuo, 4,468,627, Cl. 330-107.000.
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Nippon Kogaku K.K.: *See*—
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Hamanishi, Yoshinari, 4,468,097, Cl. 350-427.000.
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Nippon Kokan Kabushiki Kaisha: *See*—
Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; Miyashita, Tsuneo; and Nakayama, Michio, 4,468,253, Cl. 106-97.000.
Nippon Oil Co., Ltd.: *See*—
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Yoshimura, Mistuo; and Takaoka, Akihisa, 4,468,041, Cl. 277-144.000.
Nippon Paint Co., Ltd.: *See*—
Ishikura, Shinichi; Kanda, Kazunori; Kida, Katsuaki; and Mizuguchi, Ryuzo, 4,468,493, Cl. 525-123.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Kawahara, Hideo; Nagayama, Hirotsugu; and Honda, Hisao, 4,468,420, Cl. 427-397.700.
Nippon Soken, Inc.: *See*—
Matushiro, Ryuichi; Moriguchi, Koichi; Iwamoto, Kenzi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,467,608, Cl. 60-602.000.
Nippon Steel Corporation: *See*—
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Nippondenso Co., Ltd.: *See*—
Arimura, Takashi; Yamazoe, Hisamitsu; and Matsumura, Toshimi, 4,467,770, Cl. 123-489.000.
Matsumura, Toshimi, 4,467,769, Cl. 123-489.000.
Suzuki, Atsushi; Ninomiya, Masakazu; Fukaya, Hiroyasu; and Akiyama, Susumu, 4,467,765, Cl. 123-419.000.
Takasu, Yasuhito; Iwata, Toshiharu; and Hosoe, Katsuharu, 4,467,764, Cl. 123-416.000.
Niro Plan AG: *See*—
Weber, Hans-Rudolf, 4,467,777, Cl. 126-21.00A.
Nishida, Tukasa: *See*—
Yamada, Mitsuhiko; Nishida, Tukasa; and Inoue, Toshifumi, 4,468,692, Cl. 358-76.000.
Nishihama, Hitoshi: *See*—
Yamagata, Ryutaro; Kozuka, Nobuhiko; Nishihama, Hitoshi; Koyama, Shigeo; and Sakai, Kazutada, 4,468,111, Cl. 355-3.0DD.
Nishikawa, Mineki: *See*—
Kakegawa, Makoto; Nishikawa, Mineki; and Kihara, Tomohiko, 4,468,744, Cl. 364-527.000.
Nishimiya, Tohru: *See*—
Minami, Koichi; and Nishimiya, Tohru, 4,468,033, Cl. 273-153.00S.
Nishimoto, Tetsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic rhythm performance device. 4,467,690, Cl. 84-1.030.
Nishimura, Toyohiko: *See*—
Hiratani, Hajime; Uchida, Naomi; and Nishimura, Toyohiko, 4,468,344, Cl. 260-112.00R.
Nishioka, Akira: *See*—
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Nissan Motor Company, Limited: *See*—
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Futagi, Masaaki; and Suzuki, Tadashi, 4,467,673, Cl. 74-860.000.
Hayashi, Yoshimasa; Hayakawa, Yoshikazu; and Ogawa, Naoki, 4,467,754, Cl. 123-195.00H.
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Sone, Masazumi; Hirota, Yukitsugu; Miyashita, Takao; and Igawa, Tatsuo, 4,468,543, Cl. 200-19.0DR.
Sugano, Kazuhiko; and Iwanaga, Kazuyoshi, 4,467,675, Cl. 74-869.000.
Udono, Jun, 4,467,700, Cl. 91-378.000.
Nissel Sangyo America, Ltd.: *See*—
Kubozoe, Morioki; Satow, Hisasi; and Johnson, John E., Jr., 4,468,560, Cl. 250-311.000.
Nitta, Hideo: *See*—
Asano, Hiroshi; Shimamune, Takayuki; and Nitta, Hideo, 4,468,416, Cl. 427-126.500.
Nixdorf Computer AG: *See*—
Volke, Hans-Werner; Hilkenmeier, Jurgen; Kohlhage, Hermann; and Tewes, Udo, 4,468,143, Cl. 400-248.000.
NL Industries, Inc.: *See*—
Satterwhite, Lawrence E.; and Angelo, Lawrence F., 4,467,833, Cl. 137-637.000.
Noble, Allen T., to Noble Linear Irrigation, Inc. Land irrigation system and method. 4,467,962, Cl. 239-1.000.
Noble Linear Irrigation, Inc.: *See*—
Noble, Allen T., 4,467,962, Cl. 239-1.000.
Noble, Scott W.: *See*—
Burke, Timothy M.; Smith, Paul F.; Noble, Scott W.; and Schorman, Eric R., 4,468,813, Cl. 455-38.000.
Nolte, Bobby W.: *See*—
Ledwell, Lloy W.; Ledwell, Stephen H.; and Nolte, Bobby W., 4,467,745, Cl. 119-82.000.
Noma Inc.: *See*—
Koehler, Rudolph A., 4,467,979, Cl. 242-96.000.
Nomoto, Seiichiro: *See*—
Machida, Yoshimasa; Saito, Isao; Sugiyama, Isao; Negi, Shigeto; Nomoto, Seiichiro; Ikuta, Hironori; Yamauchi, Hiroshi; and Kitoh, Kyosuke, 4,468,394, Cl. 424-246.000.

Nomura, Yuuzi: *See*—
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Nonclercq, Bernard; Le Cabec, Pierre; and Le Damany, Francois. Process for pulling cables into conduits. 4,468,003, Cl. 254-134.3FT.
Norcim Investments Pty Ltd.: *See*—
Griffin, Arnold F.; and Costello, Michael C., 4,468,303, Cl. 204-109.000.
Norcliff Thayer, Inc.: *See*—
Mitra, Arun K.; and Flynn, Robert G., 4,468,381, Cl. 424-158.000.
Norlin Industries, Inc.: *See*—
Stier, Glenn R.; and Fimsoff, Mark J., 4,467,689, Cl. 84-1.030.
Norris, Edgar T., to Toowoomba Foundry Pty. Ltd. Means of improving the utilization of energy available from a solar electric generator. 4,468,569, Cl. 290-1.00R.
Norsk Hydro a.s.: *See*—
Strand, Olaf; and Skyllingstad, Olav, 4,467,845, Cl. 141-10.000.
North, Larry; and Gold, Bryant R. Digital head-out level. 4,467,527, Cl. 33-366.000.
Northern Engraving Corporation: *See*—
Gilleo, Kenneth B.; and Kreibich, Willard H., 4,468,425, Cl. 428-172.000.
Novorsky, Donald E., to Park-Ohio Industries, Inc. Method and apparatus for quench hardening thin-walled, elongated workpieces. 4,468,010, Cl. 266-123.000.
NRM Corporation: *See*—
Enders, George E., 4,468,275, Cl. 156-401.000.
Numata, Tatsuo; Nishioka, Akira; and Hirata, Hitoshi, to Pioneer Electronic Corporation. Sound system having suppression of AM stereophonic receiving circuit-induced noise. 4,468,537, Cl. 381-15.000.
Nunokawa, Kazuo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Working distance detecting device for ophthalmic instruments. 4,468,104, Cl. 351-206.000.
N.V. Raychem S.A.: *See*—
Van Noten, Lodewijk, 4,468,536, Cl. 174-92.000.
NYA Varmlands Limtra Aktiebolag: *See*—
Eklund, Tore; and Schmidt, Torbjorn, 4,468,273, Cl. 156-286.000.
Oak Industries, Inc.: *See*—
Denley, Ronald S., 4,468,145, Cl. 400-496.000.
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Schellberg, Franz; Kauffeisen, Bernard; Oberbach, Manfred; Zingel, Gerhard; and Wieland, Gunter, 4,468,780, Cl. 373-75.000.
O'Brien, Paul R. Fluid/vacuum chamber to remove heat and heat vapor from a refrigerant fluid. 4,467,621, Cl. 62-324.100.
O'Brien, William J.; and Ciraulo, James N. Apparatus for measuring conditional characteristics of a body part. 4,467,815, Cl. 128-740.000.
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Megy, Joseph A., 4,468,248, Cl. 75-84.400.
Ochi, Shigeki: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.
Oda, Yoshio; Morimoto, Takeshi; and Matsubara, Toshiya, to Asahi Glass Company Ltd. Ion exchange membrane cell and electrolytic process using thereof. 4,468,301, Cl. 204-98.000.
O'Doherty, George O. P.; and Clinton, Albert J., to Eli Lilly and Company. Anticoccidial combinations comprising polyether antibiotics and carbanilides. 4,468,380, Cl. 424-114.000.
Oeming, Joseph A. Chuck mechanism. 4,467,681, Cl. 82-40.00A.
Oenotec Pty. Limited: *See*—
Croser, Brian J., 4,467,846, Cl. 141-47.000.
Ofenloch, Roland: *See*—
Michel, Helmut; Kampe, Wolfgang; Ofenloch, Roland; Dietmann, Karl; and Sponer, Gisbert, 4,468,520, Cl. 424-274.000.
Ogata, Yoshiro: *See*—
Akutsu, Hidezoh; and Ogata, Yoshiro, 4,468,590, Cl. 313-573.000.
Ogawa, Hidenori: *See*—
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,468,402, Cl. 424-258.000.
Ogawa, Kyosuke: *See*—
Shimizu, Isamu; Ogawa, Kyosuke; Inoue, Eiichi; and Kanbe, Junichiro, 4,468,443, Cl. 430-60.000.
Ogawa, Masaki: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,468,496, Cl. 525-233.000.
Ogawa, Naoki: *See*—
Hayashi, Yoshimasa; Hayakawa, Yoshikazu; and Ogawa, Naoki, 4,467,754, Cl. 123-195.00H.
Ogiwara, Kenzyu; and Osanai, Tooru, to Hitachi, Ltd. Method of operating water-turbine or pump water-turbine. 4,468,167, Cl. 415-1.000.
Ogrinc, Michael A.: *See*—
Gabriel, Steven A.; and Ogrinc, Michael A., 4,468,688, Cl. 358-22.000.
Ogura, Hisashi; and Tanaka, Kazuo, to West Electric Company, Ltd. Strobo apparatus. 4,468,592, Cl. 315-241.00P.
Ohara, Tsunemasa; and Suzuki, Masayuki, to Canon Kabushiki Kaisha. Battery loading device. 4,468,439, Cl. 429-1.000.
Ohba, Toshihiro; Kanatani, Yoshiharu; Kinoshita, Hiroshi; Sogabe, Morihisa; and Fujioka, Yoshihide, to Sharp Kabushiki Kaisha. Electroluminescent display panel assembly. 4,468,659, Cl. 340-719.000.
Ohkubo, Masaharu: *See*—
Tanigawa, Koichi; Ohkubo, Masaharu; Takahashi, Masayoshi; and Tamura, Yasuyuki, 4,468,110, Cl. 355-3.0TR.
Ohlson, Karl G. Method and apparatus for the batchwise production of paving mixes containing mineral aggregate and bituminous binder. 4,468,125, Cl. 366-8.000.
Ohmori, Takashi: *See*—
Nakajima, Hisao; Kikuchi, Yoshiki; and Ohmori, Takashi, 4,468,676, Cl. 346-76.0PH.
Ohtawa, Satoshi: *See*—
Morishita, Teru; Ohtawa, Satoshi; Ishioka, Yoshimichi; and Suzuki, Toshikazu, 4,467,968, Cl. 239-703.000.
Ohyama, Satoshi: *See*—
Kamata, Isao; and Ohyama, Satoshi, 4,468,716, Cl. 361-333.000.
Oime, Inc.: *See*—
Pryor, Dale H., 4,468,174, Cl. 417-238.000.
Oishi, Konosuke: *See*—
Koizumi, Hideaki; and Oishi, Konosuke, 4,468,121, Cl. 356-328.000.
Oiso, Hisayoshi; and Joyama, Norio, to Meiji Seika Kaisha Ltd. Method and apparatus for cracking nuts. 4,467,711, Cl. 99-577.000.
Oka, Toshihisa; Nakanishi, Hiroaki; Takamatsu, Ryoichi; Morioka, Takayuki; Okada, Masakazu; Hara, Hideyuki; and Kasashima, Hirokazu, to Hitachi, Ltd. Multi-computer system with plural serial bus loops. 4,468,733, Cl. 364-200.000.
Okada, Masakazu: *See*—
Oka, Toshihisa; Nakanishi, Hiroaki; Takamatsu, Ryoichi; Morioka, Takayuki; Okada, Masakazu; Hara, Hideyuki; and Kasashima, Hirokazu, 4,468,733, Cl. 364-200.000.
Okada, Yasushi; Takahashi, Fumitaka; and Tagami, Katsutoshi, to Honda Giken Kogyo Kabushiki Kaisha. Drive circuit for a piezoelectric resonator used in a fluidic gas angular rate sensor. 4,468,581, Cl. 310-316.000.
Okashima, Bob Y.: *See*—
Dixon, Robert C.; Poland, Ronald D.; Stoll, Bradley G.; and Okashima, Bob Y., 4,468,172, Cl. 417-151.000.
Okey, David W., to IML Corporation. Polyimide composite. 4,468,431, Cl. 428-317.700.
Oki Electric Industry Co., Ltd.: *See*—
Shin, Yasuhiro, 4,468,797, Cl. 377-52.000.
Okinaka, Yutaka: *See*—
Abys, Joseph A.; and Okinaka, Yutaka, 4,468,296, Cl. 204-47.000.
Okita, Tsutomu; and Masataka, Kiritani, to Fuji Photo Film Co., Ltd. Magnetic recording material. 4,468,436, Cl. 428-42.5.300.
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, to Kowa Co., Ltd. KA-6643-Series antibiotics, process for producing same and medical composition containing same. 4,468,350, Cl. 260-245.20T.
Okumura, Katsuya; and Ueda, Masaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Sputtering target. 4,468,313, Cl. 204-298.000.
Olashaw, William F.: *See*—
Postlethwait, James H.; Olashaw, William F.; and Kusek, Roger, 4,468,531, Cl. 200-50.0AA.
Olin Corporation: *See*—
Brenneman, William L., 4,467,954, Cl. 228-117.000.
Kadija, Igor V.; and Justice, David D., 4,468,312, Cl. 204-284.000.
Kadija, Igor V., 4,468,360, Cl. 264-83.000.
Marlow, Darrell W., 4,467,724, Cl. 102-520.000.
Polan, Ned W.; and Chao, Chung-Yao, 4,468,293, Cl. 204-27.000.
Sakowski, Walter J.; Bajaj, Manohar C.; and Duncan, Budd L., 4,468,377, Cl. 423-474.000.
Olivieri, Icaro, to Icaro Oliveri & C. Minuterie Metalliche S.p.A. Ski boot with locking lever device. 4,467,538, Cl. 36-121.000.
Ollinger, Janet, to Rohm and Haas Company. Pesticidal N-sulfonyl N'-oxalate phosphorodiamido(di)thioates. 4,468,387, Cl. 424-211.000.
Ollinger, Janet, to Rohm and Haas Company. Pesticidal N-(thio)acyl phosphorodiamido(di)thioates. 4,468,388, Cl. 424-211.000.
Ollinger, Janet, to Rohm and Haas Company. Pesticidal N-sulfonyl phosphorodiamido(di)thioates. 4,468,389, Cl. 424-215.000.
Olson, Harold D., to Cagles, Inc. Bird opening method and apparatus. 4,467,500, Cl. 17-52.000.
Olsson, Bengt, to Telfa Jabsco AB. Device for measuring the amount of flow and/or the speed of flow of a medium. 4,467,657, Cl. 73-861.000.
Olympus Optical Co.: *See*—
Osanai, Akira, 4,468,713, Cl. 360-130.210.
Olympus Optical Co. Ltd.: *See*—
Kenjyo, Hideyuki, 4,468,709, Cl. 358-322.000.
Omae, Tsutomu; Matsuda, Toshihiko; and Tachikawa, Makoto, to Hitachi, Ltd. Method and apparatus for controlling load current. 4,468,724, Cl. 363-88.000.
Omaly, Jean E. M.: *See*—
Cadoret, Robert M. M. H.; Omaly, Jean E. M.; and Robert, Marc A., 4,468,278, Cl. 156-610.000.
Omokawa, Hiroyoshi: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Omokawa, Hiroyoshi; Yoneyama, Koichi; Ushinohama, Kazuyuki; and Suzuki, Seiichi, 4,468,245, Cl. 71-88.000.
Onaka, Kazushige: *See*—
Kinoshita, Takao; and Onaka, Kazushige, 4,467,510, Cl. 29-157.10R.
Ondrus, Joseph F., Jr.; and Schimweg, John J., to Sunnen Products Company. Valve seat grinding device and tool for using same. 4,467,566, Cl. 51-241.0VS.
Ondrus, Theodore A.: *See*—
Knaus, Edward E.; Warren, Brent K.; and Ondrus, Theodore A., 4,468,403, Cl. 424-267.000.

Ono, Katsuyuki: *See*—
Ikeda, Seiji; Ono, Katsuyuki; and Matsumura, Shozo, 4,467,676, Cl. 81-56.000.
Ono, Shigetoshi: *See*—
Nakamura, Shigeru; Ono, Shigetoshi; Suzuki, Seiji; and Suzuki, Hirohisa, 4,468,452, Cl. 430-223.000.
Optelecom, Incorporated: *See*—
Schmadel, Donald; Culver, William H.; and Gould, Gordon, 4,468,091, Cl. 350-96.300.
Orndorff, Roy L., Jr.: *See*—
Kramer, James H.; Orndorff, Roy L., Jr.; Stephens, James M.; and Presutto, Vincent T., 4,468,056, Cl. 285-281.000.
Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
de Nora, Oronzio; Nidola, Antonio; and Martelli, Gian N., 4,468,311, Cl. 204-252.000.
Orth, Charles D., to Singer Company, The. Flange mounted thermostatic expansion valve. 4,468,054, Cl. 285-137.00R.
Osada, Shinichi: *See*—
Kataoka, Kenzo; Matoba, Kazunari; and Osada, Shinichi, 4,468,198, Cl. 433-63.000.
Osaka Gas Kabushiki Kaisha: *See*—
Murakami, Shinichi; Sugitani, Junichi; and Yoshimoto, Teruo, 4,467,654, Cl. 73-640.000.
Osaka Oxygen Industries Ltd.: *See*—
Matsui, Sigeo; Tukahara, Yogo; Hayashi, Shigeki; and Kumagai, Masahiko, 4,468,238, Cl. 55-26.000.
Osaki, Masaru: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.
Osanai, Akira, to Olympus Optical Co. Tape recorder tape guide mechanism fixed on pinch roller lever. 4,468,713, Cl. 360-130.210.
Osanai, Tooru: *See*—
Ogiwara, Kenzyu; and Osanai, Tooru, 4,468,167, Cl. 415-1.000.
Osborn, Paul V., to Mobil Oil Corporation. Apparatus for forming and advancing transverse yarn reaches. 4,467,506, Cl. 28-102.000.
Oshikubo, Yuuji. Repeating dispenser. 4,467,942, Cl. 222-44.000.
Ostapchenko, George J.: *See*—
Hatchadoorian, Edward; Ostapchenko, George J.; and Young, Harlan S., 4,468,426, Cl. 428-213.000.
Oster, Stanley M. Drill press and stand. 4,468,159, Cl. 408-56.000.
Oswald, Hendrikus J.; Butler, Russell H.; and Li, Hsin L., to Allied Corporation. Apparatus and method for producing commingled continuous variable texture yarn. 4,467,507, Cl. 28-257.000.
Otani, Yukio: *See*—
Ikeda, Junichi; Utsumi, Noriyuki; and Otani, Yukio, 4,468,695, Cl. 358-101.000.
Otdel Fiziko-Tekhnicheskikh Problem Energetiki Uralskogo Nauchnogo Tsentra Akademii Nauk SSSR: *See*—
Kiseev, Valery M.; Maidanik, Jury F.; and Gerasimov, Jury F., 4,467,861, Cl. 165-104.220.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,468,402, Cl. 424-258.000.
Otte, Hubert J., to Techdel International Inc. Inclination instrument. 4,467,526, Cl. 33-304.000.
Otto, Josef: *See*—
Bauer, Hanns G.; Zollner, Dietz H.; Otto, Josef; Muhlenbeck, Josef; Rittmann, Friedrich; Conradty, Claudio; Lauterbach-Dammler, Inge; and Sonke, Horst, 4,468,783, Cl. 373-93.000.
Oudar, Jean-Louis. Bistable optical device. 4,468,772, Cl. 372-8.000.
Owen, Douglas B., to D. W. Zimmerman Mfg., Inc. Fluid driven successive stage bladder pump. 4,468,175, Cl. 417-394.000.
Owens-Corning Fiberglas Corporation: *See*—
Dunn, Charles S.; and Seng, Stephen, 4,468,164, Cl. 414-165.000.
Ruede, Paul P., 4,468,430, Cl. 428-291.000.
Sunkle, Thomas H.; and Cox, John M., 4,468,768, Cl. 371-16.000.
Owens-Illinois, Inc.: *See*—
Kontz, Robert F., 4,468,277, Cl. 156-567.000.
Paccar, Inc.: *See*—
Strong, John R., 4,468,014, Cl. 267-47.000.
Pace, W. G.: *See*—
Hardy, Thomas G.; Kaganov, Alan L.; and Pace, W. G., 4,467,804, Cl. 128-334.00C.
Pagano, Anthony L. Apparatus for nailing pickets on stringers. 4,467,951, Cl. 227-48.000.
Paine, Donald C.: *See*—
Daigle, Louis J. L.; Paine, Donald C.; and Bednarczyk, Anthony J., 4,468,726, Cl. 363-161.000.
Paisley, James K.: *See*—
Carroll, Thomas J.; and Paisley, James K., 4,467,859, Cl. 165-57.000.
Palaith, David E.: *See*—
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Palangio, Patrick J.: *See*—
Shaver, Brian W.; and Palangio, Patrick J., 4,468,004, Cl. 254-325.000.
Pallini, Luciano: *See*—
Chiusoli, Gian Paolo; Costa, Mirco; Pallini, Luciano; and Terenghi, Giuliana, 4,468,522, Cl. 560-155.000.
Pallos, Ferenc M., to Stauffer Chemical Company. Guanidinyl herbicide antidotes. 4,468,246, Cl. 71-100.000.
Palmer, James K.; Long, James C.; and Kinzer, Charles E. Flow meter. 4,467,644, Cl. 73-198.000.
Palmguard, Inc.: *See*—
Moulton, Clifford H., 4,468,807, Cl. 382-2.000.
Palumbo, Paul S.: *See*—
Meneghini, Frank A.; and Palumbo, Paul S., 4,468,450, Cl. 430-222.000.
Pangburn, Charles A. Miniature basketball backboard assembly attachable to a doorframe, door, or the like. 4,468,027, Cl. 273-1.50R.
Papsdorf, Peter: *See*—
Primke, Konrad; Papsdorf, Peter; Pohle, Gunther; and Trautmann, Klaus-Peter, 4,468,008, Cl. 266-99.000.
Papuchon, Michel; Arditty, Herve J.; and Puech, Claude, to Thomson-CSF. Hybrid optical junction and its use in a loop interferometer. 4,468,085, Cl. 350-96.140.
Park-Ohio Industries, Inc.: *See*—
Arnosky, Joseph E., 4,468,549, Cl. 219-10.770.
Novorsky, Donald E., 4,468,010, Cl. 266-123.000.
Parker, Alan; and Farnhill, William M., to Platt Saco Lowell Corporation. Method of spinning a yarn from two types of stable fibers. 4,467,597, Cl. 57-401.000.
Parker-Hannifin Corporation: *See*—
Mayfield, William B., 4,468,221, Cl. 604-152.000.
Parker, Peter D.; and Frueh, Eric L., to Amax Inc. Processing copper-nickel matte. 4,468,302, Cl. 204-108.000.
Parker, Theodore L., to Dow Chemical Company, The. Method of limiting rate of heat evolution during acid-catalyzed phenol/polymethylolphenol condensations. 4,468,507, Cl. 525-491.000.
Parks, Gerald: *See*—
Gregory, John R.; Parks, Gerald; and Dondero, John D., 4,467,475, Cl. 2-2.000.
Parrish, Robert G.: *See*—
Bowen, Michael W.; and Parrish, Robert G., 4,468,505, Cl. 525-432.000.
Pasbrig, Max, to Lacrex Brevetti S.A. Venting and degasifying valve for a liquid-filled system. 4,467,827, Cl. 137-197.000.
Patch, David W.: *See*—
Maffei, Ernest; and Patch, David W., 4,467,794, Cl. 128-92.08C.
Patel, Kalyanji U., to Minnesota Mining and Manufacturing Company. Fluorinated alcohols. 4,468,527, Cl. 564-96.000.
Patten, James W.; Moss, Ronald W.; and McClanahan, Edwin D., to Battelle Memorial Institute. Deposited films with improved microstructures. 4,468,437, Cl. 428-553.000.
Paul, Prem S.; and Van Deusen, Richard A., to United States of America, Agriculture. Monoclonal antibodies to porcine immunoglobulins. 4,468,346, Cl. 260-112.00B.
Pavone, Robert J., to Gerber Scientific Instrument Company, The. Vacuum zone control valve. 4,468,017, Cl. 269-21.000.
Peacock, Jonathan H. B.; and Kurtz, John B., to B.T.P. Cocker Chemicals Limited. Control of legionella pneumophila in water systems. 4,468,332, Cl. 210-755.000.
Pearce, David R.; and Lien, Archie S., to United States of America, Navy. Inplace ball valve repair apparatus. 4,468,158, Cl. 408-16.000.
Pearson, Carl E.; and Higgins, Timothy J., to General Electric Company. Gas turbine fuel system. 4,467,610, Cl. 60-739.000.
Pearson, Glenn A. Fire retardant powders. 4,468,495, Cl. 525-158.000.
Pedersen, Kristen I., to Sofec, Inc. Apparatus for single point mooring. 4,468,205, Cl. 441-5.000.
Peikert, Jurgen, to Messerschmitt-Boelkow-Blohm GmbH. System for controlling the thrust nozzle adjustment of dual cycle gas turbine jet propulsion engines. 4,467,600, Cl. 60-204.000.
Pelikan Aktiengesellschaft: *See*—
Manusch, Christoph; and Kupferschmidt, Wolfgang, 4,468,147, Cl. 401-292.000.
Pellico, Michael A., to Laclede Professional Products, Inc. Settable alignate compositions containing polyacrylamide. 4,468,484, Cl. 523-109.000.
Pels, Susan J.; and Schaeffer, Donald W., to Xerox Corporation. Higher productivity recirculative document copying. 4,468,114, Cl. 355-14.00R.
Penril Corp.: *See*—
Hanson, Colin J., 4,468,610, Cl. 324-61.00R.
Peranio, Anthony. Solar energy actuated apparatus for distilling water from liquids and solids. 4,467,788, Cl. 126-433.000.
Percival, George. Rack supply system. 4,467,926, Cl. 211-106.000.
Perkin-Elmer Corporation, The: *See*—
Chamran, Mort; and Ferber, Alan, 4,468,601, Cl. 318-696.000.
Perlino, Silvano, to Necchi Societa per Azioni. Automatic apparatus for executing sewings according to a determined contour. 4,467,736, Cl. 112-121.140.
Permelec Electrode Ltd.: *See*—
Asano, Hiroshi; Shimamune, Takayuki; and Nitta, Hideo, 4,468,416, Cl. 427-126.500.
Permo S.A.: *See*—
Le Dall, Guy, 4,468,318, Cl. 210-96.100.
Perrine, Walter E. Angular shape firing pin for use with a collapsible toggle recoil in a hand held weapon. 4,467,698, Cl. 89-190.000.
Perry, Robert E. Chart sequencing device. 4,467,542, Cl. 40-530.000.
Peters, Rex B.; Malametz, Arnold; Tonn, Jeffrey F.; Lee, Charles K.; Gogic, Aleksandar M.; and Corey, Victor B., to Sundstrand Data Control, Inc. Method for determining acceleration. 4,467,651, Cl. 73-497.000.
Peterson, Lars-Eric; and Soderlind, Jan. Method and device for the production of thin slices of frozen meat suitable for roasting or grilling. 4,467,497, Cl. 17-45.000.
Petry, Kurt: *See*—
Hager, Walter; and Petry, Kurt, 4,467,739, Cl. 112-153.000.
Pettersson, Sven G. Transparency mount. 4,467,541, Cl. 40-158.00B.

Pews, Richard G.: *See*—
Lysenko, Zenon; and Pews, Richard G., 4,468,354, Cl. 260-465.700.

Pfaff, Georg: *See*—
Mezger, Manfred; Pfaff, Georg; and Seeger, Karl, 4,467,776, Cl. 123-609.000.

Pfaff Industriemaschinen GmbH: *See*—
Hager, Walter; and Petry, Kurt, 4,467,739, Cl. 112-153.000.
Martin, Alfred, 4,467,733, Cl. 112-2.000.
Walther, Karl-Heinz; Vollmar, Kurt; and Dusch, Albert, 4,467,738, Cl. 112-129.000.

Pfeffer, Darrell A.: *See*—
Fitzgerald, Edward A.; and Pfeffer, Darrell A., 4,468,605, Cl. 320-36.000.

Pfister, Werner; and Schlosser, Ewald, to Licentia Patent-Verwaltungs-GmbH. Method of controlling the partial pressure of at least one substance mixture or mixture of substances. 4,468,258, Cl. 148-1.500.

Pfizer Inc.: *See*—
Pirie, Donald K.; and Weeks, Paul D., 4,468,351, Cl. 260-245.20R.
Volkmann, Robert A., 4,468,516, Cl. 548-154.000.

Phillipps, Patrick G.; and Fairchild, William G., to American Home Products Corporation. System for controlling a strip chart recorder. 4,468,678, Cl. 346-139.00R.

Phillips Petroleum Company: *See*—
Hopkins, Thomas R., 4,468,455, Cl. 435-3.000.

Picard, Peter: *See*—
Lechner, Robert; von Sichart, Frithjof; and Picard, Peter, 4,468,651, Cl. 340-347.0CC.

Piccirilli, Robert; and Chang, Wen-Hsuan, to PPG Industries, Inc. Polymeric organo functional silanes as reactive modifying materials. 4,468,492, Cl. 525-102.000.

Pieper, Werner: *See*—
Krause, Werner; and Pieper, Werner, 4,468,355, Cl. 260-502.40R.

Pierson, Charles W., to Eastman Kodak Company. Method of making a device for determining analyte activity. 4,468,271, Cl. 156-220.000.

Pike, Russell E.: *See*—
Rane, Dinanath F.; Wright, John J.; and Pike, Russell E., 4,468,404, Cl. 424-269.000.

Piller, Don W.: *See*—
Chamoff, Martin E.; and Piller, Don W., 4,468,750, Cl. 364-900.000.

Pineau, Andre L. Shock and/or vibration damping device for use between a supporting element and a supported element. 4,468,016, Cl. 267-141.000.

Pinsley, Jules, to Humphrey, Peter; and Pinsley, Jules. Foldable photographic object and camera support. 4,468,108, Cl. 354-293.000.

Pioch, Richard P., to Eli Lilly and Company. 2-[2-(2-Aminoalkyl-4-thiazolylmethylthio)alkyl]-amino-5-substituted-4-pyrimidones. 4,468,399, Cl. 424-251.000.

Pioneer Electronic Corporation: *See*—
Numata, Tatsuo; Nishioka, Akira; and Hirata, Hitoshi, 4,468,537, Cl. 381-15.000.

Pippert, Aaron J.; and Miser, H. T., to Utex Industries, Inc. Anti-extrusion sealing device with interlocked retainer portions. 4,468,042, Cl. 277-188.00A.

Pirie, Donald K.; and Weeks, Paul D., to Pfizer Inc. Process for debromination of dibromopenicillanic acid and derivatives. 4,468,351, Cl. 260-245.20R.

Pirzer Co.: *See*—
Jorss, Norbert, 4,467,909, Cl. 198-481.000.

Pitre-Jones, Inc.: *See*—
Jones, Clarence L., 4,468,546, Cl. 200-84.00B.

Plant, Robert, to AE PLC. Spacer-expander for pistons. 4,468,040, Cl. 277-140.000.

Platonova, Ada T.: *See*—
Voronkov, Mikhail G.; Platonova, Ada T.; Annenkova, Vladislava Z.; Annenkova, Valentina M.; Kazimirovskaya, Valentina B.; and Ugrjumova, Galina S., 4,468,378, Cl. 424-81.000.

Platt, Clark I.; and Hageman, James R., to Whirlpool Corporation. Pump for a dispensing system for an automatic washer. 4,467,627, Cl. 68-17.00R.

Platt Saco Lowell Corporation: *See*—
Parker, Alan; and Farnhill, William M., 4,467,597, Cl. 57-401.000.

Pliefke, Engelbert, to Hoechst Aktiengesellschaft. Process for electrochemically roughening aluminum for printing plate supports. 4,468,295, Cl. 204-33.000.

PLM A.B.: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,467,929, Cl. 215-1.00C.
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larsen, Lars G., 4,468,187, Cl. 425-363.00.

Plunkett, Luther C., Jr., to Lanier Business Products, Inc. Dictation recording and transcribing system with variable playback sequence. 4,468,751, Cl. 364-900.000.

Pneumatic Scale Corporation: *See*—
Jennings, Frederick R., 4,468,212, Cl. 493-52.000.

Pohle, Gunther: *See*—
Primke, Konrad; Papsdorf, Peter; Pohle, Gunther; and Trautmann, Klaus-Peter, 4,468,008, Cl. 266-99.000.

Polan, Ned W.; and Chao, Chung-Yao, to Olin Corporation. Electrochemical treatment of copper for improving its bond strength. 4,468,293, Cl. 204-27.000.

Poland, Ronald D.: *See*—
Dixon, Robert C.; Poland, Ronald D.; Stoll, Bradley G.; and Okashima, Bob Y., 4,468,172, Cl. 417-151.000.

Polar Research, Inc.: *See*—
Ellington, Gary L.; and Miller, Wendell E., 4,468,671, Cl. 343-766.000.

Polaroid Corporation: *See*—
Arbree, Roberta R.; Foley, James W.; and Meneghini, Frank A., 4,468,449, Cl. 430-222.000.
Barton, Derek H. R.; Bronstein-Bonte, Irena Y.; and Taylor, Lloyd D., 4,468,494, Cl. 525-353.000.
Foley, James W., 4,468,451, Cl. 430-222.000.
Meneghini, Frank A.; and Palumbo, Paul S., 4,468,450, Cl. 430-222.000.
Rogers, Howard G., 4,468,448, Cl. 430-222.000.
Wray, William R.; and Burkhardt, James, 4,468,637, Cl. 331-143.000.

Pollack, Solomon R.: *See*—
Brighton, Carl T.; and Pollack, Solomon R., 4,467,808, Cl. 128-419.00F.

Polzer, Bernhard J.: *See*—
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., 4,467,877, Cl. 173-12.000.

Postlethwait, James H.; Olashaw, William F.; and Kusek, Roger, to General Electric Company. Safety shield assembly for a drawout-type circuit breaker. 4,468,531, Cl. 200-50.0AA.

Potjes, Robert A.; and Degroot, Rudolph C., Sr., to Sencon Engineering Inc. Control system for diesel powered refrigeration plant. 4,467,615, Cl. 62-158.000.

Potz, Gunther: *See*—
Gotze, Volkmar; and Potz, Gunther, 4,468,735, Cl. 364-200.000.

Pounds, Walter R., to KB Denver, Inc. Keyboard assembly. 4,468,542, Cl. 200-5.00A.

Povall, Gerald W.: *See*—
Bradley, Irving; and Povall, Gerald W., 4,468,071, Cl. 339-50.00C.

PPG Industries, Inc.: *See*—
Hedden, Jerry C.; and Allen, Lesley M., 4,467,916, Cl. 206-410.000.
Krass, Dennis K.; and Richter, Sidney B., 4,468,244, Cl. 71-88.000.
Piccirilli, Robert; and Chang, Wen-Hsuan, 4,468,492, Cl. 525-102.000.
Rowley, James R., 4,467,922, Cl. 206-597.000.
Wismer, Marco; and Bosso, Joseph F., 4,468,307, Cl. 204-181.00C.

Precision Connector Designs, Inc.: *See*—
Machcinski, Stephen A., 4,468,073, Cl. 339-74.00R.

Precision Mechanique Labinal: *See*—
Abraham, Michel, 4,467,641, Cl. 73-146.500.

Prein, Franz: *See*—
Karning, Heinrich; and Prein, Franz, 4,468,778, Cl. 372-108.000.

Pressure Products Company, Inc.: *See*—
Meginnis, Charles E., deceased, 4,468,095, Cl. 350-319.000.

Presutto, Vincent T.: *See*—
Kramer, James H.; Orndorff, Roy L., Jr.; Stephens, James M.; and Presutto, Vincent T., 4,468,056, Cl. 285-281.000.

Preti, George, to Monell Chemical Senses Center. Method for detecting bovine estrus by determining methyl heptanol concentrations in vaginal secretions. 4,467,814, Cl. 128-738.000.

Preussag Aktiengesellschaft Metall: *See*—
Janssen, Klaus; Meier, Jurgen; and Frank, Siegfried, 4,468,154, Cl. 405-128.000.

Preziuso, Ciro: *See*—
Colle, Roberto; Gozzo, Franco; and Preziuso, Ciro, 4,468,243, Cl. 71-88.000.

Price, James W. Adjustable cradle for supporting and stabilizing boats. 4,468,150, Cl. 405-7.000.

Primke, Konrad; Papsdorf, Peter; Pohle, Gunther; and Trautmann, Klaus-Peter, to VEB Mansfeld Kombinat Wilhelm Pieck. Feeder apparatus for melting furnaces, particularly for plasma melting furnaces. 4,468,008, Cl. 266-99.000.

Prince Corporation: *See*—
Marcus, Konrad H.; and Fleming, Dennis J., 4,468,062, Cl. 296-97.00G.

Procter & Gamble Company, The: *See*—
Dornbusch, Arthur H.; and Blaut, Robert W., 4,467,923, Cl. 206-602.000.
Early, Allen D.; Cawlfield, David W.; Walker, Trevor; and Weisman, Paul T., 4,468,428, Cl. 428-221.000.

Progressive Energy Systems, Inc.: *See*—
Laviguer, Charles F., 4,467,959, Cl. 237-55.000.

Protectair Limited: *See*—
Young, David E.; and Boyes, David H., 4,467,792, Cl. 128-88.000.

Provost, Wayne. Apparatus and method for detecting cavities. 4,468,197, Cl. 433-30.000.

Prussia, Stanley E.: *See*—
Verma, Brahm P.; and Prussia, Stanley E., 4,467,710, Cl. 99-571.000.

Pryor, Dale H., to Oime, Inc. Helicopter transportable mud pump. 4,468,174, Cl. 417-238.000.

Psi Star, Inc.: *See*—
Nelson, Norvell J., 4,468,284, Cl. 156-643.000.

Puchalski, Chester: *See*—
Gold, Elijah H.; Kaminski, James J.; and Puchalski, Chester, 4,468,400, Cl. 424-256.000.

Pucher, Richard A.: *See*—
Musser, Glenn A.; McDuffie, James W.; Pucher, Richard A.; Redding, Lloyd W.; and Waldrop, T. William, 4,467,590, Cl. 56-11.200.

Puckette, Charles M.: *See*—
Baker, Lewin T.; Bose, Sanjay K.; Ellis, George W.; and Puckette, Charles M., 4,468,792, Cl. 375-45.000.

Puech, Claude: *See*—
Papuchon, Michel; Arditty, Herve J.; and Puech, Claude, 4,468,085, Cl. 350-96.140.

Pulver, Peggy C. Fishing lure storage apparatus. 4,467,551, Cl. 43-54.100.

Punako, Stephen: *See*—
Frear, David L.; Punako, Stephen; MacAvoy, David W.; and Gallusser, David O., 4,468,078, Cl. 339-90.00R.

Purcell, Billy D.: *See*—
Bogaczyk, Francis W.; Croll, Richard C.; Purcell, Billy D.; and Toutant, Edward E., 4,467,976, Cl. 242-67.30R.

Purex Corporation: *See*—
Lindberg, Gordon A., 4,468,338, Cl. 252-105.000.

Puryaev, Daniil T., to Vysshee Voennoe Tekhnicheskoe Uchilische Imeni N.E. Baumana. Interferometer for checking the shape of convex surfaces of optical components. 4,468,122, Cl. 356-360.000.

Pyle, Stoddard H., to Excor, Inc. Device for protecting an orientable circular saw or like tool. 4,467,686, Cl. 83-478.000.

Quest 80 Limited: *See*—
Knowles, Richard T., 4,468,209, Cl. 464-180.000.

Quintal, Yvan. System for charging the battery and operating the electrical accessories of a sail-boat. 4,468,606, Cl. 320-61.000.

Quist, Robert, to Westbrook Greenhouses Limited. Fastener kit for sheet materials. 4,467,504, Cl. 24-462.000.

Ragout, Bernard, to Caoutchouc Manufacture et Plastiques. Flexible tube means, especially for an expansible valve. 4,467,836, Cl. 138-93.000.

Rahdener Maschinenfabrik August Kolbus: *See*—
Rathert, Horst, 4,467,912, Cl. 198-650.000.

RAJ Research Corp.: *See*—
D'Agostino, Vincent F.; and Lee, Joseph Y., 4,468,441, Cl. 429-105.000.

Railton, Jeffrey D.: *See*—
Lemon, Peter H. R. B.; Railton, Jeffrey D.; Ludlam, Peter R.; and Reynolds, Timothy J., 4,468,359, Cl. 264-82.000.

Ralph, Brian. Method of splicing motion picture film negatives. 4,468,268, Cl. 156-159.000.

Ramet, Claude; and Rojey, Alexandre, to Institut Francais du Petrole. Process for the heating and/or thermal conditioning of a building by means of a heat pump operated with a specific mixture of working fluids. 4,468,337, Cl. 252-67.000.

Ramser, Robert A.; Barch, Daniel R.; Buchovecky, Kalman E.; and Kuchera, Ray A., to Aluminum Company of America. Apparatus for the production of particulate metal. 4,468,183, Cl. 425-7.000.

Rana, Virendra V. S.: *See*—
Blank, Stuart L.; and Rana, Virendra V. S., 4,468,438, Cl. 428-692.000.

Randelli, Pierre. Transmission device. 4,468,208, Cl. 464-117.000.

Rane, Dinanath F.; Wright, John J.; and Pike, Russell E., to Schering Corporation. 3-Aralkyloxy-2,3-dihydro-2-(triazolymethyl)benzo(b)-thiophenes. 4,468,404, Cl. 424-269.000.

Rapp, Robert A.: *See*—
Byrne, Stephen C.; Ray, Siba P.; and Rapp, Robert A., 4,468,299, Cl. 204-60.000.

Rashleigh, Scott: *See*—
Ulrich, Reinhard; and Rashleigh, Scott, 4,468,090, Cl. 350-96.300.

Rathert, Horst, to Rahdener Maschinenfabrik August Kolbus. Book block gripper for a transport system. 4,467,912, Cl. 198-650.000.

Rathman, Robert. All terrain herbicide applicator system. 4,467,558, Cl. 47-1.500.

Ratzloff, Harry; and Reimer, Jacob J. Wheelbarrow and garden tool storage rack. 4,467,925, Cl. 211-60.00T.

Raver, Norman, to International Business Machines Corporation. Automated logical file design system with reduced data base redundancy. 4,468,732, Cl. 364-200.000.

Rawlings, David L., to International Hydron Corporation. Gas feed means for use in centrifugal casting devices. 4,468,184, Cl. 425-73.000.

Ray, Siba P.: *See*—
Byrne, Stephen C.; Ray, Siba P.; and Rapp, Robert A., 4,468,299, Cl. 204-60.000.
Byrne, Stephen C.; and Ray, Siba P., 4,468,300, Cl. 204-60.000.

Raychem Corporation: *See*—
Hine, Jean P.; and McGaffigan, Thomas H., 4,468,076, Cl. 339-75.00M.

RCA Corporation: *See*—
Crowley, Albert T., 4,468,632, Cl. 331-14.000.
Goldberg, Selwyn B., 4,468,631, Cl. 330-284.000.
Greenstein, Bernard, 4,467,638, Cl. 73-64.400.
Haferl, Peter E., 4,468,593, Cl. 315-371.000.
Schlack, Richard E.; and Richard, Kenny S., 4,468,588, Cl. 313-417.000.
Weaver, Charles A., 4,468,290, Cl. 204-5.000.

Rea, Samuel N.: *See*—
Bender, David L.; and Rea, Samuel N., 4,468,280, Cl. 156-624.000.
Bender, David L.; and Rea, Samuel N., 4,468,281, Cl. 156-624.000.

Reader's Digest Association, Inc., The: *See*—
Smith, Thomas J., 4,467,920, Cl. 206-457.000.

Redding, Lloyd W.: *See*—
Musser, Glenn A.; McDuffie, James W.; Pucher, Richard A.; Redding, Lloyd W.; and Waldrop, T. William, 4,467,590, Cl. 56-11.200.

Redwine, Fletcher H.; and Thompson, James E., to United States Steel Corporation. Reciprocable pump. 4,467,703, Cl. 92-128.000.

Reece, Carla F.; and Vanacore, Vincent D., to AT&T Technologies, Inc. Methods and apparatus for providing enhanced announcements in a telephone system. 4,468,528, Cl. 179-18.00B.

Reedy, James D.: *See*—
Yang, Kang; and Reedy, James D., 4,468,476, Cl. 502-83.000.

Reeves, Richard, to British Gas Corporation. Non-destructive detection of the surface properties of ferromagnetic materials. 4,468,619, Cl. 324-220.000.

Regie Nationale des Usines Renault: *See*—
Chaffiotte, Pierre, 4,467,606, Cl. 60-602.000.
Lamy, Jean-Michel, 4,467,672, Cl. 74-713.000.

Rehbein, Thomas J.; and Bonser, Wayne, to United States of America, Air Force. Programmable synchronous digital delay line. 4,468,624, Cl. 328-55.000.

Reichlin, Seymour: *See*—
Bacha, Patricia; Reichlin, Seymour; and Murphy, John R., 4,468,382, Cl. 424-177.000.

Reimann, Robert C., to United States of America, Energy. Counterflow absorber for an absorption refrigeration system. 4,467,623, Cl. 62-494.000.

Reimer, Jacob J.: *See*—
Ratzloff, Harry; and Reimer, Jacob J., 4,467,925, Cl. 211-60.00T.

Reimert, Larry E., to Dril Quip, Inc. Wellhead apparatus. 4,468,055, Cl. 285-141.000.

Reist, Walter, to Feramatic AG. Fluid-actuated drive. 4,467,705, Cl. 92-137.000.

Reliance Electric Company: *See*—
Kammiller, Neil A., 4,468,722, Cl. 363-71.000.

Remus, Hans-Jurgen: *See*—
Antognini, Luciano; and Remus, Hans-Jurgen, 4,468,602, Cl. 318-696.000.

Renaud, Pierre, to Valeo. Clutch release bearings. 4,467,904, Cl. 192-98.000.

Renault Vehicules Industriels: *See*—
Dazzi, Jean-Louis, 4,467,757, Cl. 123-198.0DB.

Reno, James J., Jr., to Zenith Electronics Corporation. On/off and shutdown circuit for CRT projection system. 4,468,715, Cl. 361-186.000.

REPA Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,467,980, Cl. 242-107.40B.

Repromed, Inc.: *See*—
Bhiwandiwala, Pouru; and Wheeler, Robert G., 4,467,806, Cl. 128-341.000.

Research Foundation of State University of New York, The: *See*—
Bardos, Thomas J.; Cheng, Yung-Chi; and Schroeder, Alan C., 4,468,384, Cl. 424-180.000.

Research Institute of Electric and Magnetic Alloys, The: *See*—
Masumoto, Hakaru; and Nakamura, Naoji, 4,468,370, Cl. 420-463.000.

Resonant Technology Company: *See*—
Gurries, Raymond A., 4,467,539, Cl. 37-118.00R.

Reynolds, Timothy J.: *See*—
Lemon, Peter H. R. B.; Railton, Jeffrey D.; Ludlam, Peter R.; and Reynolds, Timothy J., 4,468,359, Cl. 264-82.000.

Rheaume, Walter A., to Textile Products, Incorporated. Apparatus and process for producing woven, non-linear shapes from graphite fabric, and the like, and products produced therefrom. 4,467,838, Cl. 139-305.000.

Rhodes, Richard P.; and Rose, Kenneth D., to Exxon Research and Engineering Co. Hydropyrolysis of carbonaceous material. 4,468,314, Cl. 208-8.00R.

Rhythm Watch Co., Ltd.: *See*—
Nakamura, Norihiko, 4,468,132, Cl. 368-76.000.

Richard, Kenny S.: *See*—
Schlack, Richard E.; and Richard, Kenny S., 4,468,588, Cl. 313-417.000.

Richter, Sidney B.: *See*—
Krass, Dennis K.; and Richter, Sidney B., 4,468,244, Cl. 71-88.000.

Ricoh Company, Ltd.: *See*—
Inokuchi, Toshiyuki, 4,468,094, Cl. 350-299.000.

Riddell, William D.: *See*—
Langford, Cooper A.; Jones, John; and Riddell, William D., 4,467,785, Cl. 126-400.000.

Riebeek, Gerardus F., to American Microsystems, Inc. Dual charge pump envelope generator. 4,468,798, Cl. 377-57.000.

Rietsch, Eike, to Deutsche Texaco Aktiengesellschaft. Noise suppression method. 4,468,761, Cl. 367-43.000.

Rigterink, Raymond H.; and Sbragia, Ronald J., to Dow Chemical Company, The. Substituted N-aroyl N'-phenyl urea compounds. 4,468,405, Cl. 424-322.000.

Riley, Terry W., to Techsearch, Inc. Chip budding machine. 4,467,559, Cl. 47-7.000.

Ringwall, Carl G., to General Electric Company. Velocity sensor and method of producing a velocity signal. 4,468,617, Cl. 324-165.000.

Ripka, Chester D., to Carrier Corporation. High efficiency clamshell heat exchanger. 4,467,780, Cl. 126-110.00R.

Risebrough, Robert W.: *See*—
de Lappe, Brock W.; Risebrough, Robert W.; Walker, Wayman, II; and Colledge, Edwin H., 4,468,324, Cl. 210-350.000.

Ritter, Gerhard: *See*—
Gott, Hans; Scherr, Rudolf; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,468,550, Cl. 219-56.000.

Ritter, Josef: *See*—
Gott, Hans; Scherr, Rudolf; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,468,550, Cl. 219-56.000.

Ritter, Klaus: *See*—
Gott, Hans; Scherr, Rudolf; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,468,550, Cl. 219-56.000.

Ritter, Robert A. Diaphragm valve for multiple vessel cascade gas enrichment system. 4,467,999, Cl. 251-61.100.

Rittmann, Friedrich: *See*—
Bauer, Hanns G.; Zollner, Dieter H.; Otto, Josef; Muhlenbeck, Josef; Rittmann, Friedrich; Conradty, Claudio; Lauterbach-Dammler, Inge; and Sonke, Horst, 4,468,783, Cl. 373-93.000.

Roanoke College: *See*—
Frantz, Virgil L., 4,468,239, Cl. 55-162.000.

Roark, Carl D. Leg exercise apparatus with elevated stand and lower line grinding member. 4,468,026, Cl. 272-136.000.

Robbins, Alexander G., to General Electric Company. Face pumped laser host mounting. 4,468,774, Cl. 372-34.000.

Robert Bosch GmbH: *See*—
Beck, Lothar; Schnaibel, Eberhard; and Sigl, Alfred, 4,468,740, Cl. 364-426.000.
Becker, Wolfram; and Klein, Hermann, 4,467,774, Cl. 123-568.000.
Buck, Rainer; Kuttner, Thomas; and Wessel, Wolf, 4,467,775, Cl. 123-571.000.
Fischer, Werner; and Locher, Johannes, 4,467,762, Cl. 123-357.000.
Jansen, Helmut, 4,468,185, Cl. 425-133.100.
Kampichler, Gunter; Kuschmierz, Heinz; and Schenk, Bernhard, 4,467,767, Cl. 123-467.000.
Mezger, Manfred; Pfaff, Georg; and Seeger, Karl, 4,467,776, Cl. 123-609.000.
Rohde, Siegfried; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; and Schramm, Herbert, 4,467,634, Cl. 73-35.000.
Wissmann, Michael, 4,467,766, Cl. 123-454.000.

Robert, Francis: *See*—
Monnier, Jean-Luc; and Robert, Francis, 4,468,666, Cl. 340-870.290.

Robert, Marc A.: *See*—
Cadoret, Robert M. M. H.; Omaly, Jean E. M.; and Robert, Marc A., 4,468,278, Cl. 156-610.000.

Robertson, Daniel S.: *See*—
Farrow, Robin F. C.; and Robertson, Daniel S., 4,468,685, Cl. 357-30.000.

Robertson, Gene V.; and Robertson, Robert G. Steering stabilizer. 4,467,884, Cl. 180-90.000.

Robertson, Robert G.: *See*—
Robertson, Gene V.; and Robertson, Robert G., 4,467,884, Cl. 180-90.000.

Robin, Remi: *See*—
Baumard, Rene ; Erckelboudt, Andre ; Moulin, Bernard; and Robin, Remi, 4,468,597, Cl. 318-317.000.

Robinson, Lawrence P. Shortened antenna with coaxial telescoping cylinders. 4,468,675, Cl. 343-828.000.

Rochat, Jean-Denis; and Zellweger, Conrad, to LN Industries S.A. Device for controlling the mixture and flow of at least two fluids. 4,467,834, Cl. 137-637.000.

Rock Leasing, Inc.: *See*—
Jenkins, Claire L., 4,468,067, Cl. 312-140.000.

Rockwell International Corporation: *See*—
DeClaire, Gerald; and Kramer, Dennis, 4,467,886, Cl. 180-197.000.
Jagnow, Paul G.; and Vail, David K., 4,468,784, Cl. 375-1.000.
McElreath, Kenneth W., 4,467,643, Cl. 73-178.00R.
Treu, Dennis M., 4,468,577, Cl. 310-105.000.

Rodbard, David; Shimohigashi, Y.; Chen, Hao-Chia; and Costa, Tommaso, to United States of America, Health and Human Service. Dimeric enkephalins. 4,468,383, Cl. 424-177.000.

Rogers Corporation: *See*—
Gordon, Herman B., 4,468,074, Cl. 339-75.00N.

Rogers, Howard G., to Polaroid Corporation. Photographic products and processes. 4,468,448, Cl. 430-222.000.

Rogers, Peter H.: *See*—
Zalesak, Joseph F.; and Rogers, Peter H., 4,468,760, Cl. 367-13.000.

Rohde, Siegfried; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; and Schramm, Herbert, to Robert Bosch GmbH. Internal combustion engine knocking sensing and recognition system. 4,467,634, Cl. 73-35.000.

Rohm and Haas Company: *See*—
Kowalski, Alexander; Vogel, Martin; and Blankenship, Robert M., 4,468,498, Cl. 525-301.000.
Ollinger, Janet, 4,468,387, Cl. 424-211.000.
Ollinger, Janet, 4,468,388, Cl. 424-211.000.
Ollinger, Janet, 4,468,389, Cl. 424-215.000.

Rohr, Gunter H., to Union Special GmbH. Automatic apparatus for conjointly supporting and guiding a tubular workpiece. 4,467,734, Cl. 112-63.000.

Rojey, Alexandre: *See*—
Ramet, Claude; and Rojey, Alexandre, 4,468,337, Cl. 252-67.000.

Rolfe, Norman F., to Instrumentation Laboratory Inc. Electrochemical sensor instrumentation. 4,468,608, Cl. 324-51.000.

Rolls-Royce Limited: *See*—
Hill, Christopher P. R., 4,468,304, Cl. 204-129.600.
Seymour, Donald G., 4,468,148, Cl. 403-259.000.

Rollwitz, Curtis W. Rod stand. 4,467,871, Cl. 166-369.000.

Romberg, Helmut, to BASF Aktiengesellschaft. Hydrogenation of coal. 4,468,315, Cl. 208-10.000.

Ronci, Mary R. X-Ray film cassette frame suspension apparatus. 4,468,803, Cl. 378-181.000.

Rose, Kenneth D.: *See*—
Rhodes, Richard P.; and Rose, Kenneth D., 4,468,314, Cl. 208-8.00R.

Rosenblum, Robert J., to Texas Instruments Incorporated. Method of operating magnetic bubble memory device in multipage mode. 4,468,757, Cl. 365-12.000.

Rosenthal, Bruce, to Intersil, Inc. Field terminating structure. 4,468,686, Cl. 357-53.000.

Rosser, Paul J.: *See*—
Scovell, Peter D.; Rosser, Paul J.; and Tomkins, Gary J., 4,468,308, Cl. 204-192.00R.

Rossin, John A. Simplified intruder detector. 4,468,657, Cl. 340-555.000.

Rossin, John A. Simplified intruder detection module. 4,468,658, Cl. 340-567.000.

Rosza, Kalman, to Facit Aktiebolag. Character generator. 4,468,141, Cl. 400-124.000.

Rotzler GmbH and Co. Spezialfabrik fur Seilwinden und Hebezeuge: *See*—
Frommherz, Egon, 4,468,006, Cl. 254-389.000.

Rowley, James R., to PPG Industries, Inc. Sheet shipping container having diagonally supported backwall. 4,467,922, Cl. 206-597.000.

Roy, Richard D.: *See*—
Barthel, Richard C.; and Roy, Richard D., 4,468,600, Cl. 318-452.000.

Royal-Apex Manufacturing Co. Inc.: *See*—
Kriegel, Harry F., 4,467,570, Cl. 52-12.000.

Rozario, Novellone: *See*—
Teague, Randy; Silverman, Lawrence H.; and Rozario, Novellone, 4,468,644, Cl. 333-205.000.

Rudolph, Klaus-Peter: *See*—
Klingelhoefer, Hannsgeorg; and Rudolph, Klaus-Peter, 4,467,722, Cl. 101-426.000.

Ruede, Paul P., to Owens-Corning Fiberglas Corporation. Asphalt shingle with glass fiber mat. 4,468,430, Cl. 428-291.000.

Ruff, Stanley; Wolter, Alphonse F.; and Torrence, Arthur, to Ruff, Stanley. Corrugated carton cutter. 4,467,524, Cl. 30-2.000.

Rumberger, William E., to Boeing Company, The. Debris detection system and method. 4,467,637, Cl. 73-61.00R.

Russell, James R. Spinning toy. 4,467,554, Cl. 446-242.000.

Russell, Robert E. Ventilating system for use with devices which produce airborne impurities. 4,467,782, Cl. 126-299.00D.

Russell, Ronald R., to General Electric Company. Zone selective interlock module for use with static trip circuit breakers. 4,468,714, Cl. 361-62.000.

Rutherford, Frank E. Convertible horse wagon. 4,468,046, Cl. 280-416.000.

Rydquist, Jan E.; Sandberg, Lars; and Wallin, Ralf, to AB Volvo. System for controlling the inlet pressure in a turbocharged combustion engine. 4,467,607, Cl. 60-602.000.

Rysek, Joseph J.; and Forsberg, John W., to Lubrizol Corporation, The. Aqueous compositions containing overbased materials. 4,468,339, Cl. 252-75.000.

S.N.E.C. "A.: *See*—
Aubert, Christian B., 4,468,168, Cl. 415-116.000.
Vaerman, Jean F., 4,468,620, Cl. 324-261.000.

Sabins Industries, Inc.: *See*—
Sabins, Rolland C., 4,468,310, Cl. 204-197.000.

Sabins, Rolland C., to Sabins Industries, Inc. Aluminum marine anode with core activator. 4,468,310, Cl. 204-197.000.

Sacks, William: *See*—
Degrassi, Alfieri; Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; and Mason, Charles D., 4,468,427, Cl. 428-220.000.

Sadeh, Yaacov, to Beta Engineering & Development Ltd. Sewing machine including workpiece clamping device. 4,467,735, Cl. 112-121.120.

Sadigh-Behzadi, Amir-Akbar, to Thomas & Betts Corporation. Multi-pin zero insertion force connector. 4,468,072, Cl. 339-74.00R.

Saeki, Yukio: *See*—
Matsushima, Noriaki; Saeki, Yukio; and Tokunaga, Yukio, 4,468,486, Cl. 523-146.000.

SAFT America, Inc.: *See*—
Heavey, Frederick D.; and Kaldun, Mark R., 4,468,571, Cl. 307-66.000.

Sagemuller, Franz, to Franz Sagemuller GmbH. Apparatus for cutting plant materials, in particular tobacco. 4,467,970, Cl. 241-101.200.

Saiji, Mitsuhiro: *See*—
Asada, Atsushi; Morinaga, Hisao; and Saiji, Mitsuhiro, 4,468,754, Cl. 364-900.000.

St. John, Gerald D., to Gelman Sciences Inc. Filter device with magnetic filter clamp. 4,468,321, Cl. 210-232.000.

Saito, Isao: *See*—
Machida, Yoshimasa; Saito, Isao; Sugiyama, Isao; Negi, Shigeto; Nomoto, Seiichiro; Ikuta, Hironori; Yamauchi, Hiroshi; and Kitoh, Kyosuke, 4,468,394, Cl. 424-246.000.

Saito, Noriaki: *See*—
Ito, Iko; Toyoshima, Yoshiki; Takahashi, Tsutomu; and Saito, Noriaki, 4,468,508, Cl. 525-507.000.

Saitoh, Hitoshi: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.

Sakai, Kazutada: *See*—
Yamagata, Ryutaro; Kozuka, Nobuhiko; Nishihama, Hitoshi; Koyama, Shigeo; and Sakai, Kazutada, 4,468,111, Cl. 355-3.0DD.

Sakai, Takeshi: *See*—
Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,468,518, Cl. 548-342.000.

Sakakibara, Mitsuhiko: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,468,496, Cl. 525-233.000.

Sakamoto, Seiichi, to Sanden Corporation. Improved rotation preventing device for a scroll-type fluid displacement apparatus. 4,468,181, Cl. 418-55.000.

Sakamoto, Takashi, to Dainippon Screen Mfg. Co., Ltd. Method for manufacturing half-tone printing plates. 4,468,442, Cl. 430-30.000.

Sakamoto, Yasuhei: *See*—
Ban, Tenji; Mochizuki, Kazuo; Sakamoto, Yasuhei; and Harada, Shunichi, 4,468,292, Cl. 204-27.000.

Sakane, Kazuo: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,468,515, Cl. 548-128.000.

Sakowski, Walter J.; Bajaj, Manohar C.; and Duncan, Budd L., to Olin Corporation. Continuous process for the manufacture of calcium hypochlorite. 4,468,377, Cl. 423-474.000.

Salas, Edward R.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Salas, Edward R., 4,468,731, Cl. 364-200.000.

Salloum, James S., to Formall Syn-Trac Systems, Inc. Plastic monorail conveyor drive chain wheel. 4,467,913, Cl. 198-687.000.

Salvatore, Jeremiah O., to Hughes Aircraft Company. Vortex inhibiting closed spherical outlet structure. 4,467,985, Cl. 244-135.00R.

Samuel, Richard I.; and Smith, Fred J., to Jayem Dialer Corp. Programmable automatic calling systems. 4,468,529, Cl. 179-18.0BA.

Sandberg, Lars: *See*—
Rydquist, Jan E.; Sandberg, Lars; and Wallin, Ralf, 4,467,607, Cl. 60-602.000.

Sandefur, Charles W.: *See*—
Thomas, Thomas J.; Hoguet, Robert G.; Sandefur, Charles W.; and Kalz, Dietmar, 4,468,230, Cl. 8-528.000.

Sanden Corporation: *See*—
Hiraga, Masaharu; Mabe, Atsushi; and Yoshii, Yuji, 4,468,178, Cl. 417-440.000.
Sakamoto, Seiichi, 4,468,181, Cl. 418-55.000.

Sanders Associates, Inc.: *See*—
Brodeur, Lester R., 4,468,668, Cl. 343-389.000.

Sandoz Ltd.: *See*—
Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, 4,468,347, Cl. 260-147.000.
Wicki, Heinz, 4,468,348, Cl. 260-159.000.

Sandstrom, Ake: *See*—
Thurner AB, Geodynamik H.; and Sandstrom, Ake, 4,467,652, Cl. 73-573.000.

Sangamo Weston Limited: *See*—
Metcalf, Eric; and Jeffery, Michael C., 4,468,770, Cl. 371-42.000.

Sankyo Company, Limited: *See*—
Kitano, Noritoshi, 4,468,390, Cl. 424-232.000.

Sano, Shoichi: *See*—
Furukawa, Yoshimi; and Sano, Shoichi, 4,467,885, Cl. 180-140.000.

Sanshin Electric Co., Ltd.: *See*—
Miyata, Hiroyasu; Watanabe, Keizo; and Yamaguchi, Akio, 4,467,671, Cl. 74-10.850.

Sanshukakan Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Toshiyoshi, 4,467,717, Cl. 100-117.000.

Sanyo Electric Co., Ltd.: *See*—
Takahashi, Shigeyuki; Yoshida, Nobuyuki; and Kobayashi, Masahiro, 4,467,622, Cl. 62-354.000.
Tanaka, Kouji; and Yamada, Susumu, 4,468,607, Cl. 323-354.000.

Sarazen, Philip R. Attachment system for detachable roller skates. 4,468,045, Cl. 280-11.300.

Sasaki, Kan: *See*—
Katayama, Nobuaki; Terakura, Yukio; Ikemoto, Kazuhito; and Sasaki, Kan, 4,467,665, Cl. 74-339.000.

Sasaki, Kouji: *See*—
Takemori, Satoshi; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,468,777, Cl. 372-107.000.

Sasaki, Seiko, to Seiko Instruments & Electronics Ltd. Electronic timepiece. 4,468,133, Cl. 368-156.000.

Sasaki, Susumu; and Shizuka, Masayuki, to Hitachi, Ltd. AC Generator directly coupled with internal combustion engine. 4,468,580, Cl. 310-237.000.

Sasaki, Tamotsu; Takagaki, Tetsuya; and Ikeda, Kenichi, to Hitachi, Ltd. Thermal treatment apparatus. 4,468,195, Cl. 432-36.000.

Sasaki, Toshihiko, to Mitsubishi Denki Kabushiki Kaisha. Elevator for water examining instrument. 4,467,648, Cl. 73-432.00R.

Sasano, Naoshige; and Kowata, Nobuo, to Showa Electric Wire & Cable Co., Ltd. Liquid level detecting device and method for producing the same. 4,468,567, Cl. 250-577.000.

Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, to Eisai Co., Ltd.; and Director General of the Agency of Industrial Science and Technology. Two-functional-group-containing terpenoids, processes for the preparation of the same, and anti-ulcer agents containing the same. 4,468,458, Cl. 435-134.000.

Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, to Eisai Co., Ltd.; and Director General of the Agency of Industrial Science and Technology. Process for the preparation of polyprenyl ketone derivatives. 4,468,459, Cl. 435-136.000.

Sato, Clifford S. Diagnosing cancer by observing marker glycosaminoglycans extracted from patient. 4,468,465, Cl. 436-64.000.

Sato, Hideo: *See*—
Inoue, Hiromichi; Inukai, Takashi; Goto, Yasuyuki; Sato, Hideo; and Fukui, Masahiro, 4,468,340, Cl. 252-299.630.

Sato, Hiroshi: *See*—
Kaneda, Hiroshi; Sato, Hiroshi; Nashimoto, Katsunori; and Matsui, Tadashi, 4,468,262, Cl. 148-156.000.

Sato, Yukio: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.

Satou, Susumu: *See*—
Kodera, Toshihiko; Eguchi, Kiyoshi; Ishikawa, Takayoshi; Genba, Yasushi; Tamaru, Shigemi; and Satou, Susumu, 4,468,533, Cl. 200-153.0SC.

Satow, Hisasi: *See*—
Kubozoe, Morioki; Satow, Hisasi; and Johnson, John E., Jr., 4,468,560, Cl. 250-311.000.

Satterwhite, Lawrence E.; and Angelo, Lawrence F., to NL Industries, Inc. Control valve and electrical and hydraulic control system. 4,467,833, Cl. 137-637.000.

Sauerwein, William D.; Weber, Steve A.; and Dibbern, John E., Jr., to Black & Decker Inc. Locking mechanism for a rotary power machine. 4,467,896, Cl. 188-69.000.

Saunders Archery Co.: *See*—
Saunders, Charles A., 4,468,038, Cl. 273-422.000.

Saunders, Charles A., to Saunders Archery Co. Broadhead assembly for arrow. 4,468,038, Cl. 273-422.000.

Sauter Feinmechanik GmbH: *See*—
Kettel, Hans, 4,467,680, Cl. 82-36.00A.

Sawyer, Donald T.; and Calderwood, Thomas S., to University of California, Regents of the. Degradation and detoxification of halogenated olefinic hydrocarbons. 4,468,297, Cl. 204-59.00R.

Saxon, Ross E.; and Bryant, W. Robert, to Nautilus Environmentals, Inc. Transportable hyperbaric life support chamber. 4,467,798, Cl. 128-205.260.

Sbragia, Ronald J.: *See*—
Rigterink, Raymond H.; and Sbragia, Ronald J., 4,468,405, Cl. 424-322.000.

Scapa Inc.: *See*—
Westhead, William T., 4,467,839, Cl. 139-383.00A.

Schaapveld, Junice A. Baby carrier. 4,467,945, Cl. 224-160.000.

Schabereiter, Heinz; and Tosch, Josef, to Vereinigte Edelstahlwerke AG. Welding additive material substantially free of cobalt and carbide for deposit welding. 4,468,250, Cl. 75-128.00A.

Schaeffer, Donald W.: *See*—
Pels, Susan J.; and Schaeffer, Donald W., 4,468,114, Cl. 355-14.00R.

Schatz, Joshua G., to Virginia Adjustable Bed Manufacturing Corp. Headboard bracket. 4,467,486, Cl. 5-508.000.

Scheer, Martin: *See*—
Fengler, Gerd; Botta, Artur; Scheer, Martin; and Berschauer, Friedrich, 4,468,392, Cl. 424-244.000.

Schellberg, Franz; Kauffeisen, Bernard; Oberbach, Manfred; Zingel, Gerhard; and Wieland, Gunter, to Didier-Werke A.G. Method of lining a steel-making furnace. 4,468,780, Cl. 373-75.000.

Schenk, Bernhard: *See*—
Kampichler, Gunter; Kuschmierz, Heinz; and Schenk, Bernhard, 4,467,767, Cl. 123-467.000.

Schepers, Herman A. J.; and Debets, Wilhelmus A. M., to Stamicarbon B.V. Polymer composition comprising nitrile copolymer, CPE and rubber. 4,468,487, Cl. 524-87.000.

Schering, Aktiengesellschaft: *See*—
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,468,395, Cl. 424-246.000.

Schering Corporation: *See*—
Gold, Elijah H.; Kaminski, James J.; and Puchalski, Chester, 4,468,400, Cl. 424-256.000.
Magatti, Charles V., 4,468,396, Cl. 424-246.000.
Rane, Dinanath P.; Wright, John J.; and Pike, Russell E., 4,468,404, Cl. 424-269.000.

Scherr, Rudolf: *See*—
Gott, Hans; Scherr, Rudolf; Ritter, Josef; Ritter, Klaus; and Ritter, Gerhard, 4,468,550, Cl. 219-56.000.

Schibinger, Joseph S.: *See*—
DeSantis, Alfred J.; and Schibinger, Joseph S., 4,468,736, Cl. 364-200.000.

Schiff, Peter. Percutaneous balloon. 4,467,790, Cl. 128-1.00D.

Schillinger, Ekkehard: *See*—
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,468,395, Cl. 424-246.000.

Schimion, Werner, to SMS Schloemann-Siemag AG. Method of flattening steel strip in rolling mill. 4,467,629, Cl. 72-17.000.

Schimko, Reinhold, to Universal Maschinenfabrik, Dr. Rudolf Schieber GmbH & Co. KG. Flat knitting machine with spool shelf. 4,467,624, Cl. 66-125.00R.

Schimweg, John J.: *See*—
Ondrus, Joseph F., Jr.; and Schimweg, John J., 4,467,566, Cl. 51-241.0VS.

Schiwiora, Harry: *See*—
Hausselt, Jurgen; Schiwiora, Harry; Stumke, Manfred; and Lutz, Klaus, 4,468,251, Cl. 106-1.180.

Schlack, Richard E.; and Richard, Kenny S., to RCA Corporation. Cathode support structure for an in-line electron gun assembly. 4,468,588, Cl. 313-417.000.

Schlag, Johannes: *See*—
Naarmann, Herbert; Kohler, Gernot; and Schlag, Johannes, 4,468,291, Cl. 204-73.000.

Schlage Lock Company: *See*—
Nelson, Kenneth R.; and Allison, James R., 4,468,059, Cl. 292-337.000.
Schlosser, Ewald: *See*—
Pfister, Werner; and Schlosser, Ewald, 4,468,258, Cl. 148-1.500.
Schlumberger Technology Corporation: *See*—
Gianzero, Stanley C.; Palaith, David E.; and Chan, David S. K., 4,468,623, Cl. 324-367.000.
Schluter, Gert; and Stahl, Jurgen, to Battelle-Institut e.V. Device for collecting cell material. 4,467,816, Cl. 128-756.000.
Schmadel, Donald; Culver, William H.; and Gould, Gordon, to Optelecom, Incorporated. Fiber optic energy sensor and demodulation system and method of making same. 4,468,091, Cl. 350-96.300.
Schmetzer, Johannes; Stetter, Jorg; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with novel imino ethers. 4,468,397, Cl. 424-248.510.
Schmid, Horst: *See*—
Doswald, Paul; Moriconi, Emil; Moser, Helmut; and Schmid, Horst, 4,468,347, Cl. 260-147.000.
Schmid, Ludwig, to Maschinenfabrik Esterer AG. Machine for cutting down logs to a desired diameter. 4,467,848, Cl. 144-4.000.
Schmidt, Friedrich-Karl. Integrated flotation filtration plant. 4,468,320, Cl. 210-97.000.
Schmidt, Torbjorn: *See*—
Eklund, Tore; and Schmidt, Torbjorn, 4,468,273, Cl. 156-286.000.
Schmit, John A.: *See*—
Antle, Paul E.; Schmit, John A.; and Smith, Edward L., 4,468,331, Cl. 210-659.00.
Schmitt, Alfred: *See*—
Glang, Reinhard; Ku, San-Mei; and Schmitt, Alfred, 4,467,519, Cl. 29-576.00B.
Schmitz, Friedhelm. Control system for the detection of leaks in insulated pipes. 4,468,609, Cl. 324-61.0QS.
Schnaibel, Eberhard: *See*—
Beck, Lothar; Schnaibel, Eberhard; and Sigl, Alfred, 4,468,740, Cl. 364-426.000.
Schneider, Egon, to Krones AG Hermann Kronseder Maschinenfabrik. Device for the distribution of upright vessels. 4,467,908, Cl. 198-441.000.
Schneidewind, Herbert: *See*—
Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, 4,468,353, Cl. 260-465.400.
Schnell, William J.; Fowles, Thomas A.; and Henhapl, Albert, to Baxter Travenol Laboratories, Inc. Overmolded closure seal. 4,467,930, Cl. 215-32.000.
Schober, Edward A., to GTE Automatic Electric Inc. Wireless telephone system with intercom signalling and auxiliary station. 4,468,539, Cl. 179-2.0EA.
Schoenmakers, Johannes J. M.; and Aldenhoven, Ghislanus M. A. M., to U.S. Philips Corporation. Mode-switching linkage for a tape cassette apparatus. 4,468,711, Cl. 360-96.300.
Schomburg, Richard A., to Cardiac Resuscitator Corporation. Biological signal source amplifier. 4,467,813, Cl. 128-702.000.
Schonfeld, Arnold, to Sperry Corporation. Printing apparatus. 4,468,677, Cl. 346-107.00R.
Schopp, Helmut: *See*—
Trinkl, Gerd; and Schopp, Helmut, 4,467,858, Cl. 164-360.000.
Schorman, Eric R.: *See*—
Burke, Timothy M.; Smith, Paul F.; Noble, Scott W.; and Schorman, Eric R., 4,468,813, Cl. 455-38.000.
Schramm, Herbert: *See*—
Rohde, Siegfried; Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; and Schramm, Herbert, 4,467,634, Cl. 73-35.000.
Schroeder, Alan C.: *See*—
Bardos, Thomas J.; Cheng, Yung-Chi; and Schroeder, Alan C., 4,468,384, Cl. 424-180.000.
Schuman, LeRoy, to Lippmann-Milwaukee, Inc. Gyratory cone crusher. 4,467,971, Cl. 241-215.000.
Schutte, Marlin D.: *See*—
McIntosh, George C.; Everdyke, Jonathan C.; and Schutte, Marlin D., 4,468,129, Cl. 366-213.000.
Schwartz, Albert H., to Sperry Corporation. Automatic memory module address assignment system for available memory modules. 4,468,729, Cl. 364-200.000.
Schwartz, Russell J.; and Sulzberg, Theodore, to Sun Chemical Corporation. Rheology modifiers for arylide yellow pigment dispersions and pigment dispersions containing same. 4,468,255, Cl. 106-288.00Q.
Schwechheimer, Heinz: *See*—
Markewitz, Wolfgang; and Schwechheimer, Heinz, 4,467,993, Cl. 249-28.000.
Scott, Brian L.; and Wagers, William D., Jr., to Scott Instruments Corporation. Process of human-machine interactive educational instruction using voice response verification. 4,468,204, Cl. 434-309.000.
Scott, Craig M.: *See*—
Thawley, S. Tom; and Scott, Craig M., 4,468,665, Cl. 340-856.000.
Scott Instruments Corporation: *See*—
Scott, Brian L.; and Wagers, William D., Jr., 4,468,204, Cl. 434-309.000.
Scovell, Peter D.; Rosser, Paul J.; and Tomkins, Gary J., to ITT Industries, Inc. Metallic silicide production. 4,468,308, Cl. 204-192.00R.
Scovill Inc.: *See*—
Snyder, George R.; and Dziura, Walter H., 4,467,907, Cl. 198-368.000.
Sealed Air Corporation: *See*—
Farrington, Douglas I., 4,467,978, Cl. 242-86.520.
Seaton, Norman T. Laser control apparatus and method. 4,468,773, Cl. 372-32.000.
Seeger, Karl: *See*—
Mezger, Manfred; Pfaff, Georg; and Seeger, Karl, 4,467,776, Cl. 123-609.000.
Seifert, Frances, administratrix: *See*—
Seifert, Reuben E., deceased; and Harich, Jakob, 4,468,372, Cl. 422-124.000.
Seifert, Reuben E., deceased (by Seifert, Frances, administratrix); and Harich, Jakob, to Harich, Jakob. Hygienic air purifying device. 4,468,372, Cl. 422-124.000.
Seiko Instruments & Electronics Ltd.: *See*—
Sasaki, Seiko, 4,468,133, Cl. 368-156.000.
Seisakusho Kabushiki Kaisha Toyoda Jidoshokki: *See*—
Araki, Hidejiro, 4,467,593, Cl. 57-96.000.
Seki, Hirokazu: *See*—
Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,468,518, Cl. 548-342.000.
Sekimoto, Masaaki; Minemura, Norihiro; Suzuki, Togi; and Tsunawaki, Kiyokazu, to Teijin Limited. Dyed polyester fiber composite structure. 4,468,434, Cl. 428-372.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Kamiyama, Fumio; Kohara, Minoru; Nagata, Mituo; and Araki, Yasuhiko, 4,468,330, Cl. 210-656.000.
Sekiya, Tomozo: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Sekiya, Tomozo; and Uenishi, Mituru, 4,468,432, Cl. 428-328.000.
Semco Instruments, Inc.: *See*—
Moore, M. Samuel, 4,467,599, Cl. 60-39.093.
Senco Products, Inc.: *See*—
Morrell, Robert F., Jr., 4,467,952, Cl. 227-123.000.
Sencon Engineering Inc.: *See*—
Potjes, Robert A.; and Degroot, Rudolph C., Sr., 4,467,615, Cl. 62-158.000.
Seng, Stephen: *See*—
Dunn, Charles S.; and Seng, Stephen, 4,468,164, Cl. 414-165.000.
Seymour, Donald G., to Rolls-Royce Limited. Means for reducing stress or fretting in clamped assemblies. 4,468,148, Cl. 403-259.000.
Sferle, Mihai. Exercise bench. 4,468,025, Cl. 272-120.000.
Shafco Industries Inc.: *See*—
Shaffer, Charles D.; and Miller, Ivan, 4,467,823, Cl. 137-15.000.
Shaffer, Charles D.; and Miller, Ivan, to Shafco Industries Inc. High pressure ball valve. 4,467,823, Cl. 137-15.000.
Shaldon, Stanley; Gullberg, Claes-Ake; and Larsson, Lars-Ake, to Gambro Lundia AB. Hemofiltration system and safety system therefor. 4,468,329, Cl. 210-651.000.
Sharp Kabushiki Kaisha: *See*—
Asada, Atsushi; Morinaga, Hisao; and Saiji, Mitsuhiro, 4,468,754, Cl. 364-900.000.
Nakamura, Tutomu; and Koyama, Tamotsu, 4,468,584, Cl. 310-370.000.
Ohba, Toshihiro; Kanatani, Yoshiharu; Kinoshita, Hiroshi; Sogabe, Morihisa; and Fujioka, Yoshihide, 4,468,659, Cl. 340-719.000.
Shaver, Brian W.; and Palangio, Patrick J. Portable lifting device. 4,468,004, Cl. 254-325.000.
Shaw Aero Devices, Inc.: *See*—
Shaw, James R., 4,467,937, Cl. 220-246.000.
Shaw, Frederic A., Jr. Personalized safety method and apparatus for a hand held weapon. 4,467,545, Cl. 42-70.00R.
Shaw, James R., to Shaw Aero Devices, Inc. Filler cap assembly. 4,467,937, Cl. 220-246.000.
Shaw, Jonathan L., to AT&T Technologies, Inc. Lock mechanism for extension ladder. 4,467,891, Cl. 182-210.000.
Shaw, Peter M.; and Dahl, Friedhelm, to Smith Brothers (Whitehaven) Limited. Tamper-evident closure for bag. 4,468,811, Cl. 383-5.000.
Shelburne Incorporated: *See*—
Vizard, David, 4,467,887, Cl. 181-265.000.
Shell Internationale Research Maatschappij B.V.: *See*—
Lebas, Denis M. P. P.; Leprince, Jean B. G. H.; and Touly, Michel, 4,467,768, Cl. 123-472.000.
Shibata, Toshihiro: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; Shibata, Toshihiro; and Arata, Ryozo, 4,468,488, Cl. 524-99.000.
Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Vane compressor having intermittent oil pressure to the vane back pressure chamber. 4,468,180, Cl. 418-15.000.
Shields, Harper: *See*—
Coble, William H.; Shields, Harper; and Farrell, Roscoe M., 4,467,626, Cl. 66-196.000.
Shimamune, Takayuki: *See*—
Asano, Hiroshi; Shimamune, Takayuki; and Nitta, Hideo, 4,468,416, Cl. 427-126.500.
Shimba, Hiroshi; Suzuki, Fumio; and Yuto, Masao, to Sumitomo Electric Industries, Ltd. Process for the production of highly expanded polyolefin insulated wires and cables. 4,468,435, Cl. 428-383.000.
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Rodbard, David; Shimohigashi, Y.; Chen, Hao-Chia; and Costa, Tommaso, 4,468,383, Cl. 424-177.000.

Shin, Yasuhiro, to Oki Electric Industry Co., Ltd. Swallow counters. 4,468,797, Cl. 377-52.000.

Shinonaga, Hideo: *See—*
Fujii, Yoshikazu; Kondo, Tomizou; Shinonaga, Hideo; and Kitadono, Kaoru, 4,468,412, Cl. 427-38.000.

Shiomura, Tetsunosuke: *See—*
Kaneko, Masahiro; Asanuma, Tadashi; Uchikawa, Nobutaka; Fujio, Ichiro; and Shiomura, Tetsunosuke, 4,468,257, Cl. 134-22.130.

Shiotari, Yoshihisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing mask type read only memory. 4,467,520, Cl. 29-576.00B.

Shirakura, Toshiharu: *See—*
Takemori, Satoshi; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,468,[illegible]77, Cl. 372-107.000.

Shirota, Norihisa: *See—*
Hashimoto, Yoshitaka; Yamamoto, Kaichi; and Shirota, Norihisa, 4,468,710, Cl. 360-9.100.

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Sasaki, Susumu; and Shizuka, Masayuki, 4,468,580, Cl. 310-237.000.

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Goldenberg, Milton D.; and Shochat, Dan, 4,468,457, Cl. 435-69.000.

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Sasano, Naoshige; and Kowata, Nobuo, 4,468,567, Cl. 250-577.000.

Shumikhin, Vladimir S.: *See—*
Zhukov, Leonid F.; Chugunny, Evgeny G.; and Shumikhin, Vladimir S., 4,468,771, Cl. 374-131.000.

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Sica, Michel. Device for removing liquid from a painting roller. 4,467,533, Cl. 34-58.000.

Siebold, Horst: *See—*
Frese, Georg; and Siebold, Horst, 4,468,622, Cl. 324-319.000.

Siegfried, David L.; Thomas, David A.; and Sperling, Leslie H., to Lehigh University. Thermoplastic interpenetrating polymer network composition and process. 4,468,499, Cl. 525-301.000.

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Feese, Wolfgang; and Vogelsberg, Dieter, 4,467,596, Cl. 57-293.000.
Frese, Georg; and Siebold, Horst, 4,468,622, Cl. 324-319.000.
Friedel, Rudolf; and Geldner, Ernst, 4,468,800, Cl. 378-131.000.
Friedel, Rudolf, 4,468,802, Cl. 378-140.000.
Kaiser, Jurgen, 4,467,972, Cl. 242-4.00R.
Lechner, Robert; von Sichart, Frithjof; and Picard, Peter, 4,468,651, Cl. 340-347.0CC.
Speeter, Winfried, 4,468,561, Cl. 250-345.000.
Zander, Hans-Hermann, 4,468,618, Cl. 324-165.000.

Siemon Company, The: *See—*
Knickerbocker, Robert H., 4,468,079, Cl. 339-97.00P.

Siener, Philip R., Jr.; and McCusker, Joseph H., to Cooley Incorporated. Material useful as roofing. 4,468,422, Cl. 428-57.000.

SIG Schweizerische Industrie-Gesellschaft: *See—*
Grundler, Bruno, 4,468,214, Cl. 493-310.000.

Sigl, Alfred: *See—*
Beck, Lothar; Schnaibel, Eberhard; and Sigl, Alfred, 4,468,740, Cl. 364-426.000.

Sigmon Company: *See—*
Sigmon, James W., 4,467,701, Cl. 92-103.00M.

Sigmon, James W., to Sigmon Company. Expansible device. 4,467,701, Cl. 92-103.00M.

Signatron, Inc.: *See—*
Kates, James M.; and Bussgang, Julian J., 4,468,804, Cl. 381-47.000.

Siirola, Jeffrey J.: *See—*
Van Sickle, Dale E.; Newland, Gordon C.; Siirola, Jeffrey J.; and Cook, Steven L., 4,468,356, Cl. 260-544.00Y.

Sikander, Ake; Bjorkman, Ake; and Jonsson, Gunther, to Lumalampan Aktiebolag. Device for the recovery of mercury. 4,468,011, Cl. 266-149.000.

Silverman, Lawrence H.: *See—*
Teague, Randy; Silverman, Lawrence H.; and Rozario, Novellone, 4,468,644, Cl. 333-205.000.

Silverman, Robert W.: *See—*
Jenden, Donald J.; Silverman, Robert W.; and Lee, Frederick C., 4,468,742, Cl. 364-497.000.

Simak, Milan. Method for sorting of seed. 4,467,560, Cl. 47-58.000.

Simitomo Chemical Company, Limited: *See—*
Kataoka, Yushin; Matsuda, Masaki; Yoshitake, Hiroshi; and Hirose, Yoshikazu, 4,468,374, Cl. 423-112.000.

Simonet, Daniel: *See—*
Bui, Ngoc C.; and Simonet, Daniel, 4,468,131, Cl. 368-69.000.

Simonton, Robert D., to Mac Engineering and Equipment Co., Inc. Apparatus for positioning tooling devices relative to a battery. 4,468,741, Cl. 364-474.000.

Sinclair, Stuart W., to Anderson, Clayton & Co. Fluid power system. 4,467,894, Cl. 187-17.000.

Singer Company, The: *See—*
Barthel, Richard C.; and Roy, Richard D., 4,468,600, Cl. 318-452.000.
Orth, Charles D., 4,468,054, Cl. 285-137.00R.
Williman, John; and Wojtanek, Guy A., 4,467,664, Cl. 74-116.000.

Single-Ply Institute of America, Inc.: *See—*
Francovitch, Thomas F., 4,467,581, Cl. 52-410.000.

Sintokogio Ltd.: *See—*
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,467,855, Cl. 164-7.100.

Sisson, Albert E.; and Hayes, Edward J., to Bendix Corporation, The. Single dump single solenoid fuel injector. 4,467,963, Cl. 239-90.000.

Siwersson, Olle L.; and Wall, Arne E., to AB Scaninventor. Vertical conveyor for bulk goods. 4,467,910, Cl. 198-518.000.

Skinner, James L., to Atlantic Richfield Company. Method and apparatus for controlling the discharge of particulate solids from an expanded bed of such solids. 4,467,531, Cl. 34-10.000.

Skinner, Robert T. Jr., to Lucas Industries Public Limited Company. Fuel injection nozzles. 4,467,965, Cl. 239-464.000.

Skogen, John D.: *See—*
Hocker, G. Benjamin; and Skogen, John D., 4,468,294, Cl. 204-27.000.

Skyllingstad, Olav: *See—*
Strand, Olaf; and Skyllingstad, Olav, 4,467,845, Cl. 141-10.000.

Slabbert, Phillipus D.: *See—*
Smith, Ernest B.; Slabbert, Phillipus D.; Bout, Bernardus J.; and Vickers, Peter C., 4,467,895, Cl. 187-29.00R.

Slavin, Michael, to Lectron Products, Inc. Electrical switch for automobile deck lid latches and the like. 4,468,545, Cl. 200-61.640.

Sledzieski, William L.: *See—*
Bosco, Peter M.; and Sledzieski, William L., 4,468,408, Cl. 426-604.000.

Slepian, Joel M. Word forming game apparatus. 4,468,035, Cl. 273-243.000.

Sloan, James W.; Tran, Truoc T.; and Jones, Frank T., III, to Motorola, Inc. Method for providing alpha particle protection for an integrated circuit die. 4,468,411, Cl. 427-8.000.

Slough, Carlton M.; and Cruser, Stephen A., to Texaco Inc. Apparatus for detecting corrosion rate. 4,468,613, Cl. 324-71.200.

Sluyterman, Albertus A. S., to U.S. Philips Corporation. Picture display device with quadrupole lenses. 4,468,587, Cl. 313-413.000.

Small, Edith M., to Illinois Tool Works Inc. Quarter turn fastener. 4,467,987, Cl. 248-68.100.

Smith Brothers (Whitehaven) Limited: *See—*
Shaw, Peter M.; and Dahl, Friedhelm, 4,468,811, Cl. 383-5.000.

Smith, Edward L.: *See—*
Antle, Paul E.; Schmit, John A.; and Smith, Edward L., 4,468,331, Cl. 210-659.000.

Smith, Eric, to WABCO Ltd. Hydro-pneumatic actuator with automatic slack adjuster. 4,467,605, Cl. 60-577.000.

Smith, Ernest B.; Slabbert, Phillipus D.; Bout, Bernardus J.; and Vickers, Peter C., to Crucible Society Anonyme. Slack rope detecting apparatus. 4,467,895, Cl. 187-29.00R.

Smith, Fred J.: *See—*
Samuel, Richard I.; and Smith, Fred J., 4,468,529, Cl. 179-18.0BA.

Smith, Ivan T. Low density loose fill insulation. 4,468,336, Cl. 252-62.000.

Smith, Lawther O.: *See—*
Molders, Werner; Freitag, Herbert; and Smith, Lawther O., 4,467,899, Cl. 188-320.000.

Smith, Michael T.: *See—*
Backer, Simon; and Smith, Michael T., 4,467,935, Cl. 220-214.000.

Smith, Paul F.: *See—*
Burke, Timothy M.; Smith, Paul F.; Noble, Scott W.; and Schorman, Eric R., 4,468,813, Cl. 455-38.000.

Smith, Robert C., to Babcock & Wilcox Company, The. Control rod drive mechanism vent valve assembly. 4,468,000, Cl. 251-84.000.

Smith, Thomas J., to Reader's Digest Association, Inc., The. Book safe. 4,467,920, Cl. 206-457.000.

Smith, William V., to Lectrolarm Custom Systems, Inc. Automatic iris control lens system. 4,468,700, Cl. 358-228.000.

Smolkov, Anatoly N.: *See—*
Kreinin, Efim V.; Smolkov, Anatoly N.; Ilin, Valentin A.; and Golykh, Vladimir T., deceased, 4,467,779, Cl. 126-91.00A.

SMS Schloemann-Siemag AG: *See—*
Schimion, Werner, 4,467,629, Cl. 72-17.000.

Snider, Charles R.: *See—*
Spooner, Frank H.; Snider, Charles R.; and Heaton, John L., 4,467,521, Cl. 29-576.00E.

Snyder, George R.; and Dziura, Walter H., to Scovill Inc. Fast-dump feeding apparatus for individually feeding fastener parts. 4,467,907, Cl. 198-368.000.

Snyder, Robert G.; Clancy, John J.; and Brenneman, Richard S. Emulsion package and method of mixing the emulsion. 4,467,915, Cl. 206-219.000.

Socha, Louis S., Jr., to Corning Glass Works. Baffled laminated extrusion dies. 4,468,366, Cl. 264-177.00R.

Socha, Louis S., Jr.: *See—*
Corbett, Daniel W.; Cunningham, George M.; and Socha, Louis S., Jr., 4,468,365, Cl. 264-177.00R.

Societe Agricole et Fonciere S.A.F.S.A.: *See—*
Arsovic, Hans M., 4,468,463, Cl. 435-316.000.

Societe Anonyme DBA: *See—*
Courbot, Pierre; and Carre, Jean-Jacques, 4,467,898, Cl. 188-73.440.

Societe Anonyme dite: Curty: *See—*
Ulmer, Georges; and Genin, Bernard C. D., 4,468,044, Cl. 277-235.00B.

Societe d'Etudes Techniques et d'Entreprises Generales Transmission Automatique & Informatique - Sodeteg Tai: *See—*
Jamet, Michel; Urien, Jean Claude; and Bureau, Gerard, 4,468,615, Cl. 324-158.00P.

Societe Nationale de Liamiante: *See*—
Drolet, Jean P.; and Chevalier, Jean P., 4,468,473, Cl. 501-155.000.

Soderlind, Jan: *See*—
Peterson, Lars-Eric; and Soderlind, Jan, 4,467,497, Cl. 17-45.000.

Sofec, Inc.: *See*—
Pedersen, Kristen L., 4,468,205, Cl. 441-5.000.

Sofranko, John A.: *See*—
Leonard, John J.; and Sofranko, John A., 4,468,523, Cl. 560-204.000.

Sogabe, Morihisa: *See*—
Ohba, Toshihiro; Kanatani, Yoshiharu; Kinoshita, Hiroshi; Sogabe, Morihisa; and Fujioka, Yoshihide, 4,468,659, Cl. 340-719.000.

Soletanche: *See*—
Montagnan, Jean-Daniel, 4,467,587, Cl. 52-169.140.

Sollich, Helmut, to Sollich KG, Spezialmaschinenfabrik. Apparatus for forming strands from moldable confectionary substance. 4,468,186, Cl. 425-294.000.

Sollich KG, Spezialmaschinenfabrik: *See*—
Sollich, Helmut, 4,468,186, Cl. 425-294.000.

Solloway, Daniel S. Aquatic neck exercise assembly. 4,468,023, Cl. 272-94.000.

Solomon, Frank, to Diamond Shamrock Corporation. Method of preparing an electrode backing layer. 4,468,362, Cl. 264-127.000.

Somal, Hardev S., to Maatschappij van Berkzel's Patent N.V. Load cell with overload protection system. 4,467,661, Cl. 73-862.620.

Somers, Rex E.; Beasey, Ray A.; and Woods, Richard E. Collapsible dwelling for children or animals. 4,467,572, Cl. 52-70.000.

Sone, Masazumi; Hirota, Yukitsugu; Miyashita, Takao; and Igawa, Tatsuo, to Nissan Motor Company, Limited; and Hitachi, Ltd. Ignition distributor. 4,468,543, Cl. 200-19.0DR.

Sonke, Horst: *See*—
Bauer, Hanns G.; Zollner, Dieter H.; Otto, Josef; Muhlenbeck, Josef; Rittmann, Friedrich; Conradty, Claudio; Lauterbach-Dammler, Inge; and Sonke, Horst, 4,468,783, Cl. 373-93.000.

Sony Corporation: *See*—
Hashimoto, Yoshitaka; Yamamoto, Kaichi; and Shirota, Norihisa, 4,468,710, Cl. 360-9.100.

Sopher, Theodore: *See*—
Wilkinson, Harlen E.; and Sopher, Theodore, 4,467,933, Cl. 220-66.000.

Soren Christian Sorensen: *See*—
Sorensen, Jens O., 4,467,786, Cl. 126-415.000.

Sorensen, Jens O., to Soren Christian Sorensen. Solar heating of water utilizing coverites. 4,467,786, Cl. 126-415.000.

Sorensen, Jens O. Core centered mold for hollow stackable plastic products. 4,467,994, Cl. 249-144.000.

Sowinski, Gerard T., to National Gypsum Company. Vented insulation system. 4,467,580, Cl. 52-302.000.

Special Products Engineering Corporation: *See*—
Fokos, Robert F.; and Alden, Dale E., 4,467,687, Cl. 83-674.000.

Spectrascan, Inc.: *See*—
Stoller, Milton, 4,467,812, Cl. 128-664.000.

Speeter, Winfried, to Siemens Aktiengesellschaft. Nondispersive infrared gas analyzer. 4,468,561, Cl. 250-345.000.

Spence, Scott L., to Johnson Service Company. High gain pneumatic switch. 4,467,998, Cl. 251-58.000.

Sperling, Leslie H.: *See*—
Siegfried, David L.; Thomas, David A.; and Sperling, Leslie H., 4,468,499, Cl. 525-301.000.

Sperry Corporation: *See*—
Mathias, Joseph S.; and Mittal, Faquir C., 4,468,717, Cl. 361-382.000.
Musser, Glenn A.; McDuffie, James W.; Pucher, Richard A.; Redding, Lloyd W.; and Waldrop, T. William, 4,467,590, Cl. 56-11.200.
Musser, Glenn A.; Swiler, Stuart O.; and Knepper, Larimer J., 4,467,819, Cl. 130-27.0JT.
Schonfeld, Arnold, 4,468,677, Cl. 346-107.00R.
Schwartz, Albert H., 4,468,729, Cl. 364-200.000.
Spooner, Frank H.; Snider, Charles R.; and Heaton, John L., 4,467,521, Cl. 29-576.00E.

Spezio, Anthony, to United States of America, Navy. Optical RF downconverter. 4,468,766, Cl. 370-3.000.

Spink, Robert W.: *See*—
Vander Meer, James C.; and Spink, Robert W., 4,468,603, Cl. 318-779.000.

Spitz, Jonathan N.: *See*—
Kung, Roger I.; Spitz, Jonathan N.; and Flannagan, Stephen T., 4,468,759, Cl. 365-201.000.

Sponer, Gisbert: *See*—
Michel, Helmut; Kampe, Wolfgang; Ofenloch, Roland; Dietmann, Karl; and Sponer, Gisbert, 4,468,520, Cl. 424-274.000.

Spooner, Frank H.; Snider, Charles R.; and Heaton, John L., to Sperry Corporation. Selective epitaxial growth of gallium arsenide with selective orientation. 4,467,521, Cl. 29-576.00E.

Staar S.A.: *See*—
d'Alayer de Costemore d'Arc, Stephane M., 4,468,406, Cl. 426-231.000.

Staat der Nederlanden: *See*—
Koops, Wierd, 4,468,323, Cl. 210-776.000.

Stabilus GmbH: *See*—
Molders, Werner; Freitag, Herbert; and Smith, Lawther O., 4,467,899, Cl. 188-320.000.

Stacor Corporation: *See*—
Morcheles, Bernard I., 4,467,924, Cl. 211-1.500.

Stahl, Jurgen: *See*—
Schluter, Gert; and Stahl, Jurgen, 4,467,816, Cl. 128-756.000.

Stal Laval Apparat AB: *See*—
Dahmen, Karl G.; and Eriksson, Roger, 4,467,635, Cl. 73-40.50R.

Stamicarbon B.V.: *See*—
Schepers, Herman A. J.; and Debets, Wilhelmus A. M., 4,468,487, Cl. 524-87.000.

Standard Oil Company: *See*—
Godfrey, Jack F.; and Grant, Charles L., 4,467,969, Cl. 241-101.00B.
Gupta, Surendra P., 4,467,869, Cl. 166-273.000.

Standard Oil Co (Indiana): *See*—
Nevitt, Thomas D., 4,468,373, Cl. 423-54.000.

Stanic, Miodrag. Shut off valve for fluids. 4,468,001, Cl. 251-86.000.

Starr, Thomas J. J., to AT&T Bell Laboratories. Arrangement for indicating when different types of electrical components are interconnected. 4,468,612, Cl. 324-66.000.

Staudenmaier, Siegfried, to A Romheld GmbH & Co. KG. Pallet clamping system for machine tools. 4,468,019, Cl. 269-56.000.

Stauffer Chemical Company: *See*—
Pallos, Ferenc M., 4,468,246, Cl. 71-100.000.

Ste Look: *See*—
le Faou, Daniel; and Menager, Henry, 4,468,049, Cl. 280-634.000.

Steele, Charles E.: *See*—
Blanchard, Russell O.; Wolff, Douglas F.; Steele, Charles E.; and Molloy, Richard P., deceased, 4,467,569, Cl. 52-9.000.

Steer, David C.: *See*—
Cox, Roger B.; and Steer, David C., 4,468,334, Cl. 252-8.50C.

Steiger Tractor, Inc.: *See*—
Batcheller, Barry D.; and Martinson, William E., 4,467,706, Cl. 98-1.500.

Stein, Dieter W.: *See*—
Koltermann, Jurgen K. D.; Stein, Dieter W.; Mattheiss, Eugen; and Polzer, Bernhard J., 4,467,877, Cl. 173-12.000.

Steinberg, Jacob H. Transparent odor-free face mask. 4,467,799, Cl. 128-206.140.

Steinberger, Helmut; and Alberts, Heinrich, to Bayer Aktiengesellschaft. Formulations of defoaming agents containing polysiloxanes and polyethers. 4,468,491, Cl. 524-493.000.

Steinmetz, Michael J.: *See*—
George, Dennis R.; Steinmetz, Michael J.; and Weber, Robert A., 4,468,219, Cl. 604-66.000.

Stenkvist, Sven-Einar, to ASEA Aktiebolag. Method and device for operating a DC arc furnace. 4,468,782, Cl. 373-84.000.

Stephan, Rudolf: *See*—
Ackermann, Otto; Bretzinger, Dieter; Schneidewind, Herbert; and Stephan, Rudolf, 4,468,353, Cl. 260-465.400.

Stephens, James M.: *See*—
Kramer, James H.; Orndorff, Roy L., Jr.; Stephens, James M.; and Presutto, Vincent T., 4,468,056, Cl. 285-281.000.

Stern, Richard A.; Babbitt, Richard W.; and Borowick, John, to United States of America, Army. Frequency scan antenna utilizing supported dielectric waveguide. 4,468,673, Cl. 343-785.000.

Stetter, Jorg: *See*—
Schmetzer, Johannes; Stetter, Jorg; Hammann, Ingeborg; and Homeyer, Bernhard, 4,468,397, Cl. 424-248.510.

Stevens, Robert L.: *See*—
McEwen, Stephen N.; Stevens, Robert L.; Benschoter, Barry R.; and Benschoter, Robert F., 4,467,633, Cl. 72-203.000.

Stewart, James B., to Conair Corporation. Actuator control for retractable bristle brushes. 4,467,821, Cl. 132-40.000.

Stewart, Ralph E. Card holder. 4,468,032, Cl. 273-148.00A.

Stichting Centraal Laboratorium van de Bloedtransfusiedienst van het Nederlandse Rode Kruis: *See*—
Aalberse, Robertus C., 4,468,470, Cl. 436-539.000.

Stier, Glenn R.; and Fimoff, Mark J., to Norlin Industries, Inc. Chord recognition technique. 4,467,689, Cl. 84-1.030.

Stoffel, James C.; Hsing, To R.; and Tandon, Jagdish C., to Xerox Corporation. Adaptive thresholder. 4,468,704, Cl. 358-282.000.

Stoll, Bradley G.: *See*—
Dixon, Robert C.; Poland, Ronald D.; Stoll, Bradley G.; and Okashima, Bob Y., 4,468,172, Cl. 417-151.000.

Stoller, Milton, to Spectrascan, Inc. Transilluminstion apparatus. 4,467,812, Cl. 128-664.000.

Stone, Barry N., to General Electric Company. Line-locked digital fluorography system. 4,468,696, Cl. 358-111.000.

Stoneburner, G. David, to Bendix Corporation, The. Digital frequency translator for offset frequency generation of unmodulated signals. 4,468,788, Cl. 375-23.000.

Storage Technology Corporation: *See*—
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,468,730, Cl. 364-200.000.

Stork, Gilbert: *See*—
Evers, William J.; Stork, Gilbert; Mookherjee, Braja D.; and Heinsohn, Howard H., Jr., 4,467,820, Cl. 131-276.000.

Stover, John C.: *See*—
Cunningham, Donald M.; and Stover, John C., 4,468,556, Cl. 219-523.000.

Strand, Olaf; and Skyllingstad, Olav, to Norsk Hydro a.s. Method and means for filling of bulk material in flexible containers. 4,467,845, Cl. 141-10.000.

Street, Sidney W.; and Beckley, Don A., to Hitco. Elastomer modified bis-maleimide resin. 4,468,497, Cl. 525-422.000.

Strimling, Walter E. Diaphragm pump arrangement in which alternately expanded and contracted chambers are used independently. 4,468,177, Cl. 417-413.000.
Stroh, Alvin L., to McMillin Wire & Plating, Inc. Collapsible rack for plastic bag. 4,467,989, Cl. 248-97.000.
Strommer, Stanley R. Light box apparatus. 4,467,727, Cl. 108-23.000.
Strong, John R., to Paccar, Inc. Composite leaf spring. 4,468,014, Cl. 267-47.000.
Strulik, Wilhelm P.; and Eidmann, Jurgen. Self-closing fire damper for duct. 4,467,824, Cl. 137-74.000.
Stumke, Manfred: *See*—
Hausselt, Jurgen; Schiwiora, Harry; Stumke, Manfred; and Lutz, Klaus, 4,468,251, Cl. 106-1.180.
Stuttgen, Friedel: *See*—
Ippen, Jakob; and Stuttgen, Friedel, 4,467,852, Cl. 152-158.000.
Su, Kai C., to Ciba-Geigy Corporation. Tinted contact lenses and a method for their preparation with reactive dyes. 4,468,229, Cl. 8-507.000.
Sudo, Hajime; and Takahashi, Atsushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Rotary anode X-ray tube. 4,468,801, Cl. 378-132.000.
Suga, Masaaki: *See*—
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Futagi, Masaaki; and Suzuki, Tadashi, 4,467,673, Cl. 74-860.000.
Suga, Michihisa; and Tsuzuki, Mitsuo, to Nippon Electric Co., Ltd. On-demand type ink-jet printer. 4,468,679, Cl. 346-140.00R.
Suga, Noriyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Frequency relay for use in the protection of electric power transmission lines. 4,468,796, Cl. 377-28.000.
Sugano, Kazuhiko; and Iwanaga, Kazuyoshi, to Nissan Motor Company, Limited. Shift device for hydraulic control system for automatic transmission. 4,467,675, Cl. 74-869.000.
Sugasawa, Fukashi: *See*—
Iizuka, Haruhiko; and Sugasawa, Fukashi, 4,467,602, Cl. 60-276.000.
Sugawara, Hiroyuki: *See*—
Takemori, Satoshi; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, 4,468,777, Cl. 372-107.000.
Suggitt, Robert M., to Texaco Development Corporation. Disposal process for halogenated organic material. 4,468,376, Cl. 423-358.000.
Sugihara, Saburo: *See*—
Muramatsu, Kozo; Hirai, Masanori; Sugihara, Saburo; and Nakamura, Hirozumi, 4,468,289, Cl. 204-1.00T.
Sugitani, Junichi: *See*—
Murakami, Shinichi; Sugitani, Junichi; and Yoshimoto, Teruo, 4,467,654, Cl. 73-640.000.
Sugiyama, Isao: *See*—
Machida, Yoshimasa; Saito, Isao; Sugiyama, Isao; Negi, Shigeto; Nomoto, Seiichiro; Ikuta, Hironori; Yamauchi, Hiroshi; and Kitoh, Kyosuke, 4,468,394, Cl. 424-246.000.
Sugizaki, Kennosuke: *See*—
Fujita, Shuji; Sugizaki, Kennosuke; and Kiyota, Keiichi, 4,468,693, Cl. 358-78.000.
Sukeda, Toshiaki: *See*—
Tamura, Masayoshi; Kinoshita, Ryohei; Matsubayashi, Norio; Matsumoto, Mitsuharu; Sukeda, Toshiaki; and Hirakawa, Osamu, 4,468,075, Cl. 339-75.00M.
Sullivan, Daniel J.: *See*—
Logan, David J.; and Sullivan, Daniel J., 4,467,525, Cl. 33-18.00B.
Sulzberg, Theodore: *See*—
Schwartz, Russell J.; and Sulzberg, Theodore, 4,468,255, Cl. 106-288.00Q.
Sumitomo Chemical Company, Limited: *See*—
Fujii, Yoshikazu; Kondo, Tomizou; Shinonaga, Hideo; and Kitadono, Kaoru, 4,468,412, Cl. 427-38.000.
Ito, Iko; Toyoshima, Yoshiki; Takahashi, Tsutomu; and Saito, Noriaki, 4,468,508, Cl. 525-507.000.
Sumitomo Durez Company, Ltd.: *See*—
Matsushima, Noriaki; Saeki, Yukio; and Tokunaga, Yukio, 4,468,486, Cl. 523-146.000.
Sumitomo Electric Industries, Ltd.: *See*—
Shimba, Hiroshi; Suzuki, Fumio; and Yuto, Masao, 4,468,435, Cl. 428-383.000.
Sun Chemical Corporation: *See*—
Schwartz, Russell J.; and Sulzberg, Theodore, 4,468,255, Cl. 106-288.00Q.
Sunbeam Plastics Corporation: *See*—
Gach, Peter P., 4,467,931, Cl. 215-237.000.
Sundstrand Data Control, Inc.: *See*—
Peters, Rex B.; Malametz, Arnold; Tonn, Jeffrey F.; Lee, Charles K.; Gogic, Aleksandar M.; and Corey, Victor B., 4,467,651, Cl. 73-497.000.
Sunkle, Thomas H.; and Cox, John M., to Owens-Corning Fiberglas Corporation. Self-testing computer monitor. 4,468,768, Cl. 371-16.000.
Sunnarborg, Robert P.: *See*—
Fish, Warren H.; and Sunnarborg, Robert P., 4,467,495, Cl. 15-354.000.
Sunnen Products Company: *See*—
Ondrus, Joseph F., Jr.; and Schimweg, John J., 4,467,566, Cl. 51-241.0VS.
Sutker, Burton J.: *See*—
Barda, Henry J.; Sutker, Burton J.; and Eldridge, William J., 4,468,481, Cl. 521-171.000.
Barda, Henry J.; Sutker, Burton J.; and Eldridge, William J., 4,468,482, Cl. 521-171.000.
Suzuki, Akio; and Hirayama, Kazuhiro, to Canon Kabushiki Kaisha. Developer concentration controlling device. 4,468,112, Cl. 355-14.00D.
Suzuki, Atsushi; Ninomiya, Masakazu; Fukaya, Hiroyasu; and Akiyama, Susumu, to Nippondenso Co., Ltd. Method and system for operating an engine at maximum torque with variable amount of dither. 4,467,765, Cl. 123-419.000.
Suzuki, Fumio: *See*—
Shimba, Hiroshi; Suzuki, Fumio; and Yuto, Masao, 4,468,435, Cl. 428-383.000.
Suzuki, Hirohisa: *See*—
Nakamura, Shigeru; Ono, Shigetoshi; Suzuki, Seiji; and Suzuki, Hirohisa, 4,468,452, Cl. 430-223.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Namba, Yuzuru; and Aoyagi, Kenichi, 4,467,760, Cl. 123-308.000.
Suzuki, Kouichi: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.
Suzuki, Masayuki: *See*—
Ohara, Tsunemasa; and Suzuki, Masayuki, 4,468,439, Cl. 429-1.000.
Suzuki, Ryo: *See*—
Hiroshima, Minoru; Hara, Kohzo; Suzuki, Ryo; and Takeshita, Masatoshi, 4,468,758, Cl. 365-15.000.
Suzuki, Seiichi: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Omokawa, Hiroyoshi; Yoneyama, Koichi; Ushinohama, Kazuyuki; and Suzuki, Seiichi, 4,468,245, Cl. 71-88.000.
Suzuki, Seiji: *See*—
Nakamura, Shigeru; Ono, Shigetoshi; Suzuki, Seiji; and Suzuki, Hirohisa, 4,468,452, Cl. 430-223.000.
Suzuki, Shingo: *See*—
Inoue, Masao; and Suzuki, Shingo, 4,468,092, Cl. 350-128.000.
Suzuki, Tadashi, to Alps Electric Co., Ltd. Small motor. 4,468,579, Cl. 310-208.000.
Suzuki, Tadashi: *See*—
Hamada, Hideo; Morimoto, Yoshiro; Suga, Masaaki; Futagi, Masaaki; and Suzuki, Tadashi, 4,467,673, Cl. 74-860.000.
Suzuki, Takeshi: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.
Suzuki, Tetsuo: *See*—
Shimizu, Shigeaki; Kubo, Yoshimi; Suzuki, Tetsuo; Kizaki, Takashi; and Igarashi, Hitoshi, 4,468,719, Cl. 361-433.000.
Suzuki, Togi: *See*—
Sekimoto, Masaaki; Minemura, Norihiro; Suzuki, Togi; and Tsunawaki, Kiyokazu, 4,468,434, Cl. 428-372.000.
Suzuki, Toshikazu: *See*—
Morishita, Teru; Ohtawa, Satoshi; Ishioka, Yoshimichi; and Suzuki, Toshikazu, 4,467,968, Cl. 239-703.000.
Suzuki, Toshio: *See*—
Miura, Azusa; Kambara, Kesao; Kinoshita, Takashi; Suzuki, Toshio; and Yonehata, Yuzuru, 4,468,572, Cl. 307-69.000.
Suzuki, Yasuo; and Chiba, Taneaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Antenna device for air traffic radar. 4,468,670, Cl. 343-727.000.
Svensson, Goran: *See*—
Karlsson, Ingemar; Svensson, Percyval; Nelenius, Eric; Svensson, Goran; Ydrefors, Axel; and Lindstrom, Bengt, 4,467,950, Cl. 226-91.000.
Svensson, Percyval: *See*—
Karlsson, Ingemar; Svensson, Percyval; Nelenius, Eric; Svensson, Goran; Ydrefors, Axel; and Lindstrom, Bengt, 4,467,950, Cl. 226-91.000.
Svoboda, Josef: *See*—
Wittmann, Heinz; and Svoboda, Josef, 4,468,048, Cl. 280-614.000.
Swanson, Hilmer I., to Herris Corporation. Polyphase PDM amplifier. 4,468,626, Cl. 330-10.000.
Swanson, Rollan, to Chemroll Enterprises, Inc. Hydrogenation of asphaltenes and the like. 4,468,316, Cl. 208-59.000.
Swiler, Stuart O.: *See*—
Musser, Glenn A.; Swiler, Stuart O.; and Knepper, Larimer J., 4,467,819, Cl. 130-27.0JT.
Szabo, Rene : *See*—
Levallois, Emile; Szabo, Rene ; Clot, Jean; and Esteve, Daniel, 4,468,155, Cl. 405-170.000.
Szakacs, Gabor L.: *See*—
Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., 4,468,743, Cl. 364-520.000.
Szczepanski, Henry, to Ciba-Geigy Corporation. Oxime derivatives for promoting the growth of soybeans. 4,468,242, Cl. 71-88.000.
Tabachnik, Joel B., to Talbot Toys Ltd. Crayon holder. 4,468,146, Cl. 401-88.000.
Tabor, David R. Fishing rod handle assembly. 4,467,548, Cl. 43-23.000.
Tachikawa, Makoto: *See*—
Omae, Tsutomu; Matsuda, Toshihiko; and Tachikawa, Makoto, 4,468,724, Cl. 363-88.000.
Tada, Naofumi, to Hitachi, Ltd. Superconducting magnet device. 4,468,646, Cl. 335-216.000.
Tagami, Katsutoshi: *See*—
Okada, Yasushi; Takahashi, Fumitaka; and Tagami, Katsutoshi, 4,468,581, Cl. 310-316.000.

Tagata, Nobuo: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,468,496, Cl. 525-233.000.

Tajima, Hiromi; and Fujiwara, Akinori, to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho. Webbing winding force restraining device. 4,467,982, Cl. 242-107.600.

Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; Miyashita, Tsuneo; and Nakayama, Michio, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for continuously manufacturing non-sintered pellet. 4,468,253, Cl. 106-97.000.

Takagaki, Tetsuya: *See*—
Sasaki, Tamotsu; Takagaki, Tetsuya; and Ikeda, Kenichi, 4,468,195, Cl. 432-36.000.

Takagi, Michiaki; and Momosaki, Eishi, to Kabushiki Kaisha Suwa Seikosha. Crystal oscillator producing two frequencies by means of amplitude modulation and demodulation. 4,468,634, Cl. 331-60.000.

Takahara, Yoshimasa: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, 4,468,458, Cl. 435-134.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.

Takahashi, Atsushi: *See*—
Sudo, Hajime; and Takahashi, Atsushi, 4,468,801, Cl. 378-132.000.

Takahashi, Fumitaka: *See*—
Okada, Yasushi; Takahashi, Fumitaka; and Tagami, Katsutoshi, 4,468,581, Cl. 310-316.000.

Takahashi, Kengo, to Hitachi, Ltd. Hydraulic dynamic electric machine. 4,468,570, Cl. 290-52.000.

Takahashi, Masayoshi: *See*—
Tanigawa, Koichi; Ohkubo, Masaharu; Takahashi, Masayoshi; and Tamura, Yasuyuki, 4,468,110, Cl. 355-3.0TR.

Takahashi, Shigeyuki; Yoshida, Nobuyuki; and Kobayashi, Masahiro, to Sanyo Electric Co., Ltd. Auger-type icemaker. 4,467,622, Cl. 62-354.000.

Takahashi, Toshiro; and Niki, Shoji, to Takeda Riken Kogyo Kabushiki Kaisha. Average frequency measuring apparatus. 4,468,614, Cl. 324-78.00D.

Takahashi, Tsutomu: *See*—
Ito, Iko; Toyoshima, Yoshiki; Takahashi, Tsutomu; and Saito, Noriaki, 4,468,508, Cl. 525-507.000.

Takahashi, Yoshitaka: *See*—
Makabe, Hachiro; Watanabe, Kazuo; and Takahashi, Yoshitaka, 4,467,740, Cl. 112-158.00E.

Takahashi, Yuji. Ironless rotor winding for electric motor. 4,468,578, Cl. 310-198.000.

Takamatsu, Ryoichi: *See*—
Oka, Toshihisa; Nakanishi, Hiroaki; Takamatsu, Ryoichi; Morioka, Takayuki; Okada, Masakazu; Hara, Hideyuki; and Kasashima, Hirokazu, 4,468,733, Cl. 364-200.000.

Takamatsu, Shuhei: *See*—
Fujimoto, Michitaro; Funazo, Giichi; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,468,518, Cl. 548-342.000.

Takaoka, Akihisa: *See*—
Yoshimura, Mitsuo; and Takaoka, Akihisa, 4,468,041, Cl. 277-144.000.

Takara Co., Ltd.: *See*—
Kanda, Shuichi, 4,467,553, Cl. 446-136.000.

Takashi, Nishida: *See*—
Fumio, Mori; Toshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, 4,468,521, Cl. 560-124.000.

Takashita, Hideshi: *See*—
Genba, Yasushi; Tamaru, Shigemi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,081, Cl. 339-176.00M.
Tamaru, Shigemi; Genba, Yasushi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,082, Cl. 339-176.00M.

Takasu, Yasuhito; Iwata, Toshiharu; and Hosoe, Katsuharu, to Nippondenso Co., Ltd. Method and apparatus for controlling ignition timing in a multicylinder internal combustion engine. 4,467,764, Cl. 123-416.000.

Takeda Riken Kogyo Kabushiki Kaisha: *See*—
Takahashi, Toshiro; and Niki, Shoji, 4,468,614, Cl. 324-78.00D.

Takeda, Ryuichiro; and Fujita, Naoaki, to Asahi Glass Company Ltd. Fiber reinforced inorganic hardened body and process for its production. 4,468,429, Cl. 428-283.000.

Takemae, Yoshihiro, to Fujitsu Limited. Inverter circuit having transistors operable in a shallow saturation region for avoiding fluctuation of electrical characteristics. 4,468,576, Cl. 307-481.000.

Takematsu, Tetsuo; Konnai, Makoto; Omokawa, Hiroyoshi; Yoneyama, Koichi; Ushinohama, Kazuyuki; and Suzuki, Seiichi, to Mitsubishi Chemical Industries Ltd. N-(2,3-Epoxypropylene)-n-aralkylsulfonamide and herbicidal compositions containing the same. 4,468,245, Cl. 71-88.000.

Takemori, Satoshi; Sugawara, Hiroyuki; Kuwabara, Kouji; Shirakura, Toshiharu; Kawakubo, Yukio; and Sasaki, Kouji, to Hitachi, Ltd. Mirror supporting frame for gas laser oscillation apparatus. 4,468,777, Cl. 372-107.000.

Takeshita, Masatoshi: *See*—
Hiroshima, Minoru; Hara, Kohzo; Suzuki, Ryo; and Takeshita, Masatoshi, 4,468,758, Cl. 365-15.000.

Takeuchi, Hiroshi, to Kabushiki Kaisha Daikin Seisakusho. Clutch disc. 4,467,905, Cl. 192-106.200.

Takeuchi, Kunihiko: *See*—
Mori, Shunji; Yamada, Hiromitsu; Takeuchi, Kunihiko; and Do, Michihisa, 4,468,808, Cl. 382-20.000.

Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, to Bridgestone Tire Co., Ltd.; and Japan Synthetic Rubber Co., Ltd. Polybutadiene rubber compositions. 4,468,496, Cl. 525-233.000.

Talbot Toys Ltd.: *See*—
Tabachnik, Joel B., 4,468,146, Cl. 401-88.000.

Tamamori, Hideo, to Nippon Air Brake Co., Ltd. Cock. 4,467,832, Cl. 137-625.470.

Tamaru, Shigemi; Genba, Yasushi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, to Mitsubishi Denki Kabushiki Kaisha. Terminal assembly for circuit interrupter. 4,468,082, Cl. 339-176.00M.

Tamaru, Shigemi: *See*—
Genba, Yasushi; Tamaru, Shigemi; Ishikawa, Takayoshi; Eguchi, Kiyoshi; and Takashita, Hideshi, 4,468,081, Cl. 339-176.00M.
Kodera, Toshihiko; Eguchi, Kiyoshi; Ishikawa, Takayoshi; Genba, Yasushi; Tamaru, Shigemi; and Satou, Susumu, 4,468,533, Cl. 200-153.08SC.

Tamura, Keiichi: *See*—
Mori, Shinji; and Tamura, Keiichi, 4,467,981, Cl. 242-107.40A.

Tamura, Masayoshi; Kinoshita, Ryohei; Matsubayashi, Norio; Matsumoto, Mitsuharu; Sukeda, Toshiaki; and Hirakawa, Osamu, to Fujitsu Limited. Structure of electrical connecting device. 4,468,075, Cl. 339-75.00M.

Tamura, Poohsan N.: *See*—
Hutcheson, Lynn D.; and Tamura, Poohsan N., 4,468,084, Cl. 350-96.110.

Tamura, Yasuyuki: *See*—
Tanigawa, Koichi; Ohkubo, Masaharu; Takahashi, Masayoshi; and Tamura, Yasuyuki, 4,468,110, Cl. 355-3.0TR.

Tanabe, Sohei: *See*—
Okuchi, Masao; Nakayama, Masahito; Iwasaki, Akio; Kimura, Shigeru; Mizoguchi, Toshimi; Tanabe, Sohei; Murakami, Akira; Ito, Hisakatsu; and Mori, Toshihito, 4,468,350, Cl. 260-245.20T.

Tanaka, Atsuo: *See*—
Donomoto, Tadashi; Tatematsu, Yoshiaki; and Tanaka, Atsuo, 4,468,272, Cl. 156-280.000.

Tanaka, Kazuo: *See*—
Ogura, Hisashi; and Tanaka, Kazuo, 4,468,592, Cl. 315-241.00P.

Tanaka, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Display apparatus for displaying characters or graphics on a cathode ray tube. 4,468,662, Cl. 340-789.000.

Tanaka, Kouji; and Yamada, Susumu, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Ladder-type signal attenuator. 4,468,607, Cl. 323-354.000.

Tandart, Pascal R.; and Villevielle, Jean L., to Texas Instruments Incorporated. Circuit for detecting synchronization pulses in a composite signal. 4,468,625, Cl. 328-139.000.

Tandon, Jagdish C.: *See*—
Stoffel, James C.; Hsing, To R.; and Tandon, Jagdish C., 4,468,704, Cl. 358-282.000.

Tandy Corporation: *See*—
Berger, Michael F., 4,468,753, Cl. 364-900.000.
Chatham, Dale, 4,468,752, Cl. 364-900.000.

Tanigawa, Koichi; Ohkubo, Masaharu; Takahashi, Masayoshi; and Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Method and apparatus for electrophotography. 4,468,110, Cl. 355-3.0TR.

Taniguchi, Katsuyuki. Tail gate opening/closing device for dump truck. 4,468,065, Cl. 298-23.00R.

Taniguchi, Kotaro, to Kubota, Ltd. Melting apparatus. 4,467,732, Cl. 110-259.000.

Tanimoto, Akikazu; and Imamura, Kazunori, to Nippon Kogaku K.K. Foreign substance inspecting apparatus. 4,468,120, Cl. 356-237.000.

Tao, Ying G.: *See*—
Duttweiler, Donald L.; Gritton, Charles W. K.; and Tao, Ying G., 4,468,641, Cl. 333-166.000.

Tatch, Fred G. Reciprocating arc-drive mechanism. 4,467,668, Cl. 74-594.200.

Tatematsu, Yoshiaki: *See*—
Donomoto, Tadashi; Tatematsu, Yoshiaki; and Tanaka, Atsuo, 4,468,272, Cl. 156-280.000.

Taylor, Lloyd D.: *See*—
Barton, Derek H. R.; Bronstein-Bonte, Irena Y.; and Taylor, Lloyd D., 4,468,494, Cl. 525-353.000.

Tcheraz, Patrick, to Etablissement Sideco International. Device for regulating the liquid flow in a pipe. 4,468,225, Cl. 604-248.000.

TDK Corporation: *See*—
Adachi, Shichiro; and Kotani, Sho, 4,468,555, Cl. 219-237.000.

Teague, Randy; Silverman, Lawrence H.; and Rozario, Novellone, to General Instrument Corp. Tunable reject filter for radar warning receiver. 4,468,644, Cl. 333-205.000.

Techdel International Inc.: *See*—
Otte, Hubert J., 4,467,526, Cl. 33-304.000.

Techsearch, Inc.: *See*—
Riley, Terry W., 4,467,559, Cl. 47-7.000.

Teijin Limited: *See*—
Sekimoto, Masaaki; Minemura, Norihiro; Suzuki, Togi; and Tsunawaki, Kiyokazu, 4,468,434, Cl. 428-372.000.

Tektronix, Inc.: *See*—
Gross, Winthrop A., 4,468,628, Cl. 330-258.000.

Tele-Drill, Inc.: *See*—
Thawley, S. Tom; and Scott, Craig M., 4,468,665, Cl. 340-856.000.

Telescope Folding Furniture Co. Inc., The: *See*—
Borichevsky, Donald J., 4,467,730, Cl. 108-159.000.

Telfa Jabsco AB: *See*—
Olsson, Bengt, 4,467,657, Cl. 73-861.000.
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. 2-Substituted oxyimino-2-(5-amino-1,2,4-thiadiazol-3-yl)acetic acids. 4,468,515, Cl. 548-128.000.
Terakura, Yukio: *See*—
Katayama, Nobuaki; Terakura, Yukio; Ikemoto, Kazuhito; and Sasaki, Kan, 4,467,665, Cl. 74-339.000.
Terenghi, Giuliana: *See*—
Chiusoli, Gian Paolo; Costa, Mirco; Pallini, Luciano; and Terenghi, Giuliana, 4,468,522, Cl. 560-155.000.
Terleski, John D.: *See*—
Hansen, Stanley W.; Terleski, John D.; and Whaley, Mark D., 4,468,738, Cl. 364-200.000.
Termaat, Albertus B., to Colpitt B.V. Method and apparatus for separating from each other two thin, slack sheets of material. 4,468,213, Cl. 493-213.000.
Terumo Kabushiki Kaisha: *See*—
Minagawa, Yoshinori; and Miyaguchi, Katsuhiko, 4,468,223, Cl. 604-199.000.
Terzian, Rouben T.; Herbstler, Horst D.; and Wozniak, Walter J., to Marvin Glass & Associates. Animated doll. 4,467,555, Cl. 446-158.000.
Tevopharm-Schiedam B.V.: *See*—
van Maanen, Johannes D., 4,467,589, Cl. 53-450.000.
Tewes, Udo: *See*—
Volke, Hans-Werner; Hilkenmeier, Jurgen; Kohlhage, Hermann; and Tewes, Udo, 4,468,143, Cl. 400-248.000.
Texaco Development Corporation: *See*—
Suggitt, Robert M., 4,468,376, Cl. 423-358.000.
Texaco Inc.: *See*—
Slough, Carlton M.; and Cruser, Stephen A., 4,468,613, Cl. 324-71.200.
Yeakey, Ernest L.; and Cuscurids, Michael, 4,468,483, Cl. 521-172.000.
Texas Instruments Incorporated: *See*—
Chiavaroli, Donald J., 4,467,773, Cl. 123-549.000.
Johnson, Charles R.; Ward, Phillip W.; Lindley, Joe H.; Maher, Robert A.; Holmes, Jerry D.; and Fuchser, Troy D., 4,468,793, Cl. 375-97.000.
Rosenblum, Robert J., 4,468,757, Cl. 365-12.000.
Tandart, Pascal R.; and Villevielle, Jean L., 4,468,625, Cl. 328-139.000.
Venturini, Marco, 4,468,725, Cl. 363-160.000.
Wiggins, Richard H., Jr.; and Brantingham, George L., 4,468,805, Cl. 381-51.000.
Textile Products, Incorporated: *See*—
Rheaume, Walter A., 4,467,838, Cl. 139-305.000.
Thawley, S. Tom; and Scott, Craig M., to Tele-Drill, Inc. Downhole digital power amplifier for a measurements-while-drilling telemetry system. 4,468,665, Cl. 340-856.000.
Thermo Electron Corporation: *See*—
Hurley, James R.; and Birkner, Joseph R., 4,467,783, Cl. 126-378.000.
Thermoplas Machinery, Inc.: *See*—
Fogarty, John E., Jr.; and Anderson, Robert W., Jr., 4,468,322, Cl. 210-236.000.
Thiel, Philip P.: *See*—
Freeman, D. Bruce; Kesse, Bernard G.; and Thiel, Philip P., 4,468,418, Cl. 427-208.200.
Thir, Basil: *See*—
Dexheimer, Edward M.; Anchor, Michael J.; Thir, Basil; and Eisenstein, Stephen E., 4,468,478, Cl. 521-125.000.
Thomas & Betts Corporation: *See*—
Law, Jose P., 4,468,535, Cl. 174-65.00R.
Sadigh-Be di, Amir-Akbar, 4,468,072, Cl. 339-74.00R.
Thomas, Davi : *See*—
Siegfried, David L.; Thomas, David A.; and Sperling, Leslie H., 4,468,499, Cl. 525-301.000.
Thomas, Mammen: *See*—
Bayman, Atiye; and Thomas, Mammen, 4,468,285, Cl. 156-643.000.
Thomas, Thomas J.; Hoguet, Robert G.; Sandefur, Charles W.; and Kalz, Dietmar, to Mobay Chemical Corporation. Acid dye dispersions. 4,468,230, Cl. 8-528.000.
Thomas, Timothy C.: *See*—
Yamane, Kiyoshi E.; Thomas, Timothy C.; and Tostado, Jose J., 4,467,647, Cl. 73-321.000.
Thompson, James E.: *See*—
Redwine, Fletcher H.; and Thompson, James E., 4,467,703, Cl. 92-128.000.
Thomson-CSF: *See*—
Ledun, Michel, 4,467,983, Cl. 242-195.000.
Papuchon, Michel; Arditty, Herve J.; and Puech, Claude, 4,468,085, Cl. 350-96.140.
Thorsell, Roland H., to Excor, Inc. Precision positioning system for rotary power tools. 4,467,684, Cl. 83-404.100.
Thorsell, Roland H., to Excor, Inc. Guard system for truss component cutting apparatus. 4,467,685, Cl. 83-478.000.
Thurner AB, Geodynamik H.; and Sandstrom, Ake, to Geodynamik H. Thurner AB. Procedure and device for compaction measurement. 4,467,652, Cl. 73-573.000.
Timex Corporation: *See*—
Cohen, Sam G., 4,468,541, Cl. 179-84.00C.
Halicho, James J., 4,468,134, Cl. 368-309.000.
Tiomkin, Michael: *See*—
Azulai, Max; Bar-Nefy, Simcha; and Tiomkin, Michael, 4,467,694, Cl. 89-1.00M.
Tippetts, Thomas B., to Garrett Corporation, The. Angular rate sensing apparatus and methods. 4,467,984, Cl. 244-78.000.
TMC Corporation: *See*—
Wittmann, Heinz; and Svoboda, Josef, 4,468,048, Cl. 280-614.000.
Todo, Hidemasa: *See*—
Wako, Shoji; and Todo, Hidemasa, 4,468,681, Cl. 346-153.100.
Tokai, Masakuni: *See*—
Yoshiwa, Masao; Hujioka, Yoshiro; Tokai, Masakuni; and Muro, Mikio, 4,467,958, Cl. 237-2.00B.
Tokico Ltd.: *See*—
Ikeda, Junichi; Utsumi, Noriyuki; and Otani, Yukio, 4,468,695, Cl. 358-101.000.
Kubo, Takaaki; and Kobayashi, Kinzo, 4,467,897, Cl. 188-73.380.
Tokunaga, Yukio: *See*—
Matsushima, Noriaki; Saeki, Yukio; and Tokunaga, Yukio, 4,468,486, Cl. 523-146.000.
Tokyo Keiki Co., & Ltd.: *See*—
Mori, Shunji; Yamada, Hiromitsu; Takeuchi, Kunihiko; and Do, Michihisa, 4,468,808, Cl. 382-20.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Nunokawa, Kazuo, 4,468,104, Cl. 351-206.000.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See*—
Kanai, Wataru, 4,468,447, Cl. 430-197.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Tanaka, Koaji; and Yamada, Susumu, 4,468,607, Cl. 323-354.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukumitsu, Akira, 4,468,764, Cl. 369-77.200.
Iida, Kazuhiko, 4,468,755, Cl. 364-900.000.
Iwata, Kazutoshi, 4,467,973, Cl. 242-7.080.
Kakegawa, Makoto; Nishikawa, Mineki; and Kihara, Tomohiko, 4,468,744, Cl. 364-527.000.
Kamata, Isao; and Ohyama, Satoshi, 4,468,716, Cl. 361-333.000.
Kawasaki, Kazumi, 4,468,165, Cl. 414-417.000.
Murase, Kazuyoshi, 4,467,534, Cl. 34-82.000.
Nagashima, Yoshitake, 4,468,689, Cl. 358-31.000.
Okumura, Katsuya; and Ueda, Masaaki, 4,468,313, Cl. 204-298.000.
Shiotari, Yoshihisa, 4,467,520, Cl. 29-576.00B.
Sudo, Hajime; and Takahashi, Atsushi, 4,468,801, Cl. 378-132.000.
Suga, Noriyoshi, 4,468,796, Cl. 377-28.000.
Suzuki, Yasuo; and Chiba, Taneaki, 4,468,670, Cl. 343-727.000.
Yamaki, Mitsuo, 4,468,548, Cl. 219-10.470.
Yamamoto, Toshio, 4,467,953, Cl. 228-116.000.
Tolliver, Wilbur E. Spacer bar and related method for concrete pipe manufacture. 4,467,995, Cl. 249-160.000.
Tomihira, Shigeru: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,468,496, Cl. 525-233.000.
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Carbostyril derivatives, process for producing the same and cardiotonic compositions containing the same. 4,468,402, Cl. 424-258.000.
Tomita, Koji: *See*—
Hanada, Minoru; Tsunakawa, Mitsuaki; Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, 4,468,386, Cl. 424-181.000.
Tomkins, Gary J.: *See*—
Scovell, Peter D.; Rosser, Paul J.; and Tomkins, Gary J., 4,468,308, Cl. 204-192.00R.
Tomy Kogyo Company, Inc.: *See*—
Iwao, Noriaki; and Abe, Akira, 4,467,556, Cl. 446-230.000.
Minami, Koichi; and Nishimiya, Tohru, 4,468,033, Cl. 273-153.00S.
Tong, Aaron C. Y.: *See*—
Grabowski, John S.; and Tong, Aaron C. Y., 4,468,809, Cl. 382-50.000.
Tonn, Jeffrey F.: *See*—
Peters, Rex B.; Malametz, Arnold; Tonn, Jeffrey F.; Lee, Charles K.; Gogic, Aleksandar M.; and Corey, Victor B., 4,467,651, Cl. 73-497.000.
Toowoomba Foundry Pty. Ltd.: *See*—
Norris, Edgar T., 4,468,569, Cl. 290-1.00R.
Torgeson, W. Lee. Loudspeaker system. 4,468,530, Cl. 179-115.5PV.
Torrence, Arthur: *See*—
Ruff, Stanley; Wolter, Alphonse F.; and Torrence, Arthur, 4,467,524, Cl. 30-2.000.
Tortuga S.A.: *See*—
Haldimann, Hans R., 4,467,725, Cl. 104-162.000.
Tosch, Josef: *See*—
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Toshiaki, Omura: *See*—
Fumio, Mori; Toshiaki, Omura; Takashi, Nishida; and Kazuo, Itoi, 4,468,521, Cl. 560-124.000.
Tostado, Jose J.: *See*—
Yamane, Kiyoshi E.; Thomas, Timothy C.; and Tostado, Jose J., 4,467,647, Cl. 73-321.000.
Totec Co., Ltd.: *See*—
Mori, Shunji; Yamada, Hiromitsu; Takeuchi, Kunihiko; and Do, Michihisa, 4,468,808, Cl. 382-20.000.
Toth, John E.: *See*—
Kirst, Herbert A.; and Toth, John E., 4,468,511, Cl. 536-7.100.
Touly, Michel: *See*—
Lebas, Denis M. P. P.; Leprince, Jean B. G. H.; and Touly, Michel, 4,467,768, Cl. 123-472.000.

Toutant, Edward E.: *See*—
Bogaczyk, Francis W.; Croll, Richard C.; Purcell, Billy D.; and Toutant, Edward E., 4,467,976, Cl. 242-67.30R.

Town, Michael-Harold: *See*—
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, 4,468,395, Cl. 424-246.000.

Townsend, Larry G. Billboard apparatus. 4,467,543, Cl. 40-624.000.

Toyoda, Shigehiro: *See*—
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, 4,467,855, Cl. 164-7.100.

Toyoshima, Yoshiki: *See*—
Ito, Iko; Toyoshima, Yoshiki; Takahashi, Tsutomu; and Saito, Noriaki, 4,468,508, Cl. 525-507.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Donomoto, Tadashi; Tatematsu, Yoshiaki; and Tanaka, Atsuo, 4,468,272, Cl. 156-280.000.
Isogai, Kiyoshi; Koga, Ituo; Yamada, Yutaka; and Haruta, Kazumi, 4,467,750, Cl. 123-188.00M.
Maeda, Yorishige, 4,467,749, Cl. 123-188.00M.
Ueno, Makoto; and Hori, Kohei, 4,467,758, Cl. 123-198.00F.
Watanabe, Noboru, 4,467,601, Cl. 60-274.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Katayama, Nobuaki; Terakura, Yukio; Ikemoto, Kazuhito; and Sasaki, Kan, 4,467,665, Cl. 74-339.000.
Matushiro, Ryuichi; Moriguchi, Koichi; Iwamoto, Kenzi; Kawai, Hisasi; Mizuno, Nobutaka; and Ikuta, Yasuhiro, 4,467,608, Cl. 60-602.000.
Morishita, Teru; Ohtawa, Satoshi; Ishioka, Yoshimichi; and Suzuki, Toshikazu, 4,467,968, Cl. 239-703.000.
Yoshida, Akio, 4,468,207, Cl. 464-65.000.

Trallfa Underhaug A/S: *See*—
Kjosavik, Dag, 4,468,745, Cl. 364-559.000.

Trammel, Edward L.; and Kelley, Hugh D. Means for aligning and securing adjacent conveyor trough structures. 4,467,914, Cl. 198-861.000.

Tran, Truoc T.: *See*—
Sloan, James W.; Tran, Truoc T.; and Jones, Frank T., III, 4,468,411, Cl. 427-8.000.

Trautmann, Klaus-Peter: *See*—
Primke, Konrad; Papsdorf, Peter; Pohle, Gunther; and Trautmann, Klaus-Peter, 4,468,008, Cl. 266-99.000.

Trede, Brian E.: *See*—
Dodd, P. David; Blickenstaff, Ronald L.; Coulson, Richard L.; Moreno, Robert J.; and Trede, Brian E., 4,468,730, Cl. 364-300.000.

Tremblay, Richard P., to Kerotest Manufacturing Corp. Actuator mechanism for double bent bellows sealed rotary valve. 4,468,002, Cl. 251-335.00B.

Treu, Dennis M., to Rockwell International Corporation. Minimization of motor slip at synchronous spin frequency of an inside-out hysteresis synchronous motor. 4,468,577, Cl. 310-105.000.

Trianco Redfyre Limited: *See*—
Babbage, Thomas A.; and Cousins, Frederick W., 4,467,778, Cl. 126-77.000.

Trinkl, Gerd; and Schopp, Helmut, to Foseco International Limited. Blind feeder sleeves. 4,467,858, Cl. 164-360.000.

Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F. Method and apparatus for removing condensate and oil particles from a stream of compressed air used in the production of snow. 4,467,614, Cl. 62-124.000.

Tropeano, Joseph T.: *See*—
Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F., 4,467,614, Cl. 62-124.000.

Tropeano, Thomas F.: *See*—
Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F., 4,467,614, Cl. 62-124.000.

Trotscher, Gerhard, to Lindauer Dornier Gesellschaft mbH. Equipment for heat-treating flat, band-like lengths of material. 4,467,537, Cl. 34-155.000.

Troutman, Ronald R.: *See*—
Bansal, Jai P.; Bertin, Claude L.; and Troutman, Ronald R., 4,467,518, Cl. 29-571.000.

Truedell, Brenda A.: *See*—
Kirst, Herbert A.; and Truedell, Brenda A., 4,468,512, Cl. 536-16.800.
Kirst, Herbert A.; and Truedell, Brenda A., 4,468,513, Cl. 536-16.800.

TRW Inc.: *See*—
Choma, John, Jr., 4,468,629, Cl. 330-260.000.
Kraus, Willibald, 4,467,988, Cl. 248-68.100.

Tsubata, Noritaka, to Yoshida Kogyo K. K. Woven slide fastener stringer and apparatus for manufacturing the same. 4,467,840, Cl. 139-384.00B.

Tsuchiya, Akira. Water-level controlled hydroponic container. 4,467,561, Cl. 47-60.000.

Tsukiura, Hiroshi: *See*—
Hanada, Minoru; Tsunakawa, Mitsuaki; Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, 4,468,386, Cl. 424-181.000.

Tsunakawa, Mitsuaki: *See*—
Hanada, Minoru; Tsunakawa, Mitsuaki; Tomita, Koji; Tsukiura, Hiroshi; and Kawaguchi, Hiroshi, 4,468,386, Cl. 424-181.000.

Tsunawaki, Kiyokazu: *See*—
Sekimoto, Masaaki; Minemura, Norihiro; Suzuki, Togi; and Tsunawaki, Kiyokazu, 4,468,434, Cl. 428-372.000.

Tsuno, Katsushige; and Ueno, Katsuyoshi, to JEOL Ltd. Electron lens. 4,468,563, Cl. 250-396.0ML.

Tsuru, Tashihiko: *See*—
Munezawa, Kazushi; and Tsuru, Tashihiko, 4,468,687, Cl. 358-19.000.

Tsuzuki, Mitsuo: *See*—
Suga, Michihisa; and Tsuzuki, Mitsuo, 4,468,679, Cl. 346-140.00R.

Tucci, John J.: *See*—
John, Waldemar; and Tucci, John J., 4,467,516, Cl. 29-566.400.

Tukahara, Yogo: *See*—
Matsui, Sigeo; Tukahara, Yogo; Hayashi, Shigeki; and Kumagai, Masahiko, 4,468,238, Cl. 55-26.000.

Turbe, Jean-Pierre, to Matix Industries S.A. Method and apparatus for ultrasonic analysis. 4,467,653, Cl. 73-620.000.

Turner, Frank E.: *See*—
Kelly, David L.; and Turner, Frank E., 4,468,149, Cl. 403-316.000.

Turner, Ralph E., Jr., to Anglo-American Clays Corporation. Selective rheological separation of clays. 4,468,317, Cl. 209-5.000.

Tward, Emanuel, to Tward 2001 Limited. Capacitive system for monitoring the dielectric properties of flowing fluid streams. 4,468,611, Cl. 324-61.00R.

Tward 2001 Limited: *See*—
Tward, Emanuel, 4,468,611, Cl. 324-61.00R.

Twiford, Richard L.; and Hood, John W., to International Telephone and Telegraph Corporation. Stripper for filling machine. 4,467,708, Cl. 99-450.800.

Uchida, Naomi: *See*—
Hiratani, Hajime; Uchida, Naomi; and Nishimura, Toyohiko, 4,468,344, Cl. 260-112.00R.

Uchida, Yasuyuki: *See*—
Mitsuyoshi, Toru; and Uchida, Yasuyuki, 4,467,505, Cl. 26-33.000.

Uchikawa, Nobutaka: *See*—
Kaneko, Masahiro; Asanuma, Tadashi; Uchikawa, Nobutaka; Fujio, Ichiro; and Shiomura, Tetsunosuke, 4,468,257, Cl. 134-22.130.

Uchikune, Mamoru. Switchable permanent magnetic chuck. 4,468,648, Cl. 335-295.000.

Udono, Jun, to Nissan Motor Company, Limited. Hydraulic boost mechanism. 4,467,700, Cl. 91-378.000.

Ueda, Masaaki: *See*—
Okumura, Katsuya; and Ueda, Masaaki, 4,468,313, Cl. 204-298.000.

Ueda, Naoaki. Static solar tracking mechanism. 4,467,787, Cl. 126-425.000.

Uenishi, Mituru: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Sekiya, Tomozo; and Uenishi, Mituru, 4,468,432, Cl. 428-328.000.

Ueno, Katsuyoshi: *See*—
Tsuno, Katsushige; and Ueno, Katsuyoshi, 4,468,563, Cl. 250-396.0ML.

Ueno, Makoto; and Hori, Kohei, to Toyota Jidosha Kabushiki Kaisha. Split engine. 4,467,758, Cl. 123-198.00F.

Ueno, Norio: *See*—
Kato, Seiji; Ueno, Norio; and Kakuishi, Mitsuo, 4,468,749, Cl. 364-861.000.

Ugrjumova, Galina S.: *See*—
Voronkov, Mikhail G.; Platonova, Ada T.; Annenkova, Vladislava Z.; Annenkova, Valentina M.; Kazimirovskaya, Valentina B.; and Ugrjumova, Galina S., 4,468,378, Cl. 424-81.000.

Ulmer, Georges; and Genin, Bernard C. D., to Societe Anonyme dite: Curty. Cylinder head gasket for internal combustion engine. 4,468,044, Cl. 277-235.00B.

Ulrich, Reinhard; and Rashleigh, Scott. Fibre optical arrangement for the transmission, in a manner preserving its polarization, of light of a defined, linear polarization state. 4,468,090, Cl. 350-96.300.

Unimed, Inc.: *See*—
Geschickter, Charles F., 4,468,393, Cl. 424-245.000.

Union Carbide Corporation: *See*—
Beckman, John H.; Haettinger, George C.; and Kupcikevicius, Vytautas, 4,467,499, Cl. 17-49.000.
Fuderer, Andrija, 4,468,237, Cl. 55-26.000.
Weinberg, Kurt; and Johnson, Gordon C., 4,468,489, Cl. 524-136.000.

Union Special GmbH: *See*—
Rohr, Gunter H., 4,467,734, Cl. 112-63.000.

United States of America
Agriculture: *See*—
Paul, Prem S.; and Van Deusen, Richard A., 4,468,346, Cl. 260-112.00B.
Air Force: *See*—
Rehbein, Thomas J.; and Bonser, Wayne, 4,468,624, Cl. 328-55.000.
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Artz, Glen D.; and Grant, Louis R., 4,468,263, Cl. 149-22.000.
Bush, Clarence C., deceased, 4,467,639, Cl. 73-66.000.
Stern, Richard A.; Babbitt, Richard W.; and Borowick, John, 4,468,673, Cl. 343-785.000.
Wang, Shii-Shyong; and Chu, Ruey-Shi, 4,468,669, Cl. 343-703.000.

United States of America as represented by the Director of the National Security Agency, The: *See*—
Gromen, William E., 4,468,789, Cl. 375-25.000.
Energy: *See*—
McLellan, Edward J., 4,468,776, Cl. 372-93.000.
Reimann, Robert C., 4,467,623, Cl. 62-494.000.
Health and Human Service: *See*—
Rodbard, David; Shimohigashi, Y.; Chen, Hao-Chia; and Costa, Tommaso, 4,468,383, Cl. 424-177.000.
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Morrissey, James H., 4,468,466, Cl. 436-86.000.
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Brown, Douglas E., 4,468,093, Cl. 350-162.120.
Navy: *See*—
Bonde, Robert L., 4,467,695, Cl. 89-1.50D.
Green, Jonathan B.; and Kino, Gordon S., 4,468,639, Cl. 333-153.000.
Lukens, James E.; Jain, Aloke K.; and Mankiewich, Paul M., 4,468,635, Cl. 331-107.00S.
Pearce, David R.; and Lien, Archie S., 4,468,158, Cl. 408-16.000.
Spezio, Anthony, 4,468,766, Cl. 370-3.000.
Waters, William M.; and Jarrett, Bobby R., 4,468,794, Cl. 375-103.000.
Zalesak, Joseph F.; and Rogers, Peter H., 4,468,760, Cl. 367-13.000.
U.S. Philips Corporation: *See*—
Bachmann, Peter K., 4,468,413, Cl. 427-39.000.
Esser, Leonard J. M.; and Heldens, Ludovicus G. M., 4,468,684, Cl. 357-24.000.
Harms, Margret; Luthje, Holger; and Matthiessen, Bernd, 4,468,799, Cl. 378-35.000.
Hofelt, Martijn H. H., 4,468,790, Cl. 375-30.000.
Kroner, Klaus, 4,468,699, Cl. 358-148.000.
Milan, Lucien R.; and Gousseau, Roland R., 4,468,087, Cl. 350-96.180.
Schoenmakers, Johannes J. M.; and Aldenhoven, Ghislanus M. A. M., 4,468,711, Cl. 360-96.300.
Sluyterman, Albertus A. S., 4,468,587, Cl. 313-413.000.
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Van Doorn, Cornelis Z.; and Lorteije, Jean H. J., 4,468,661, Cl. 340-784.000.
Verhoeven, Leonardus A. J., 4,468,697, Cl. 358-111.000.
U.S. Phillips Corporation: *See*—
Mathes, Egon, 4,468,575, Cl. 307-481.000.
United States Steel Corporation: *See*—
Redwine, Fletcher H.; and Thompson, James E., 4,467,703, Cl. 92-128.000.
United Steel Service, Inc.: *See*—
Friedman, Morris, 4,467,975, Cl. 242-564.000.
United Technologies Corporation: *See*—
Alcorta, Jorge A.; and Kildea, Robert J., 4,468,066, Cl. 308-187.000.
Daigle, Louis J. L.; Paine, Donald C.; and Bednarczyk, Anthony J., 4,468,726, Cl. 363-161.000.
Kalmanash, Michael H., 4,468,691, Cl. 358-73.000.
Unitika, Ltd.: *See*—
Matsukura, Kazuo; Murakami, Kunio; Nagasawa, Tsugio; Sekiya, Tomozo; and Uenishi, Mituru, 4,468,432, Cl. 428-328.000.
Universal Consolidated Methods, Inc.: *See*—
Yoder, Ronald L., 4,467,563, Cl. 51-163.100.
Universal Maschinenfabrik, Dr. Rudolf Schieber GmbH & Co. KG: *See*—
Schimko, Reinhold, 4,467,624, Cl. 66-125.00R.
University of Calif., The Regents of the: *See*—
de Lappe, Brock W.; Risebrough, Robert W.; Walker, Wayman, II; and Colledge, Edwin H., 4,468,324, Cl. 210-350.000.
University of California, The Regents of: *See*—
Jenden, Donald J.; Silverman, Robert W.; and Lee, Frederick C., 4,468,742, Cl. 364-497.000.
Sawyer, Donald T.; and Calderwood, Thomas S., 4,468,297, Cl. 204-59.00R.
University of Georgia Research Foundation, Inc.: *See*—
Verma, Brahm P.; and Prussia, Stanley E., 4,467,710, Cl. 99-571.000.
University of Ill., The Board of Trustees of the: *See*—
Kinghorn, Alan D.; and Marshall, Gary T., 4,468,328, Cl. 210-634.000.
University Patents, Inc.: *See*—
Goepp, Robert A.; and Freese, Uwe E., 4,467,789, Cl. 128-1.00R.
Urien, Jean Claude: *See*—
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Ushinohama, Kazuyuki: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Omokawa, Hiroyoshi; Yoneyama, Koichi; Ushinohama, Kazuyuki; and Suzuki, Seiichi, 4,468,245, Cl. 71-88.000.
Ushio Denki Kabushiki Kaisha: *See*—
Hiramoto, Tatsumi, 4,468,260, Cl. 148-1.500.
Mimura, Yoshiki, 4,468,259, Cl. 148-1.500.
USM Corporation: *See*—
Hartshorn, Frank, 4,467,487, Cl. 12-8.300.
Utex Industries, Inc.: *See*—
Pippert, Aaron J.; and Miser, H. T., 4,468,042, Cl. 277-188.00A.
Utsumi, Noriyuki: *See*—
Ikeda, Junichi; Utsumi, Noriyuki; and Otani, Yukio, 4,468,695, Cl. 358-101.000.
Uzaki, Nagato; Komori, Toshihisa; Matui, Kazuharu; and Toyoda, Shigehiro, to Sintokogio Ltd. Method of making mold. 4,467,855, Cl. 164-7.100.
Vachey, Lucien. Process for obtaining a silver product which is black-colored in its whole mass and silver products thus obtained. 4,467,856, Cl. 164-47.000.
Vaerman, Jean F., to S.N.E.C.M.A. System for in situ checking of turbine engine blades with eddy current probe guidance apparatus. 4,468,620, Cl. 324-261.000.
Vail, David K.: *See*—
Jagnow, Paul G.; and Vail, David K., 4,468,784, Cl. 375-1.000.
Vaizey, Geoffrey S., to Glanfield Lawrence (Concessions) Ltd. Device for holding logs for sawing. 4,468,018, Cl. 269-54.500.
Valdemarsson, Stefan, to ASEA Aktiebolag. Signal rectifier, especially for magnetoelastic transducers. 4,467,662, Cl. 73-862.690.
Valeo: *See*—
Renaud, Pierre, 4,467,904, Cl. 192-98.000.
Valleylab: *See*—
Lundquist, Ingemar H., 4,468,222, Cl. 604-153.000.
Van Doorne's Transmissie B.V.: *See*—
van Deursen, Petrus H.; and van der Hardt Aberson, Frederik E. C., 4,467,674, Cl. 74-867.000.
Vanacore, Vincent D.: *See*—
Reece, Carla F.; and Vanacore, Vincent D., 4,468,528, Cl. 179-18.00B.
Van Brunt, Michael K., to Automation Industries, Inc. Cable shield termination means for plug and receptacle connectors. 4,468,080, Cl. 339-136.00R.
Van de Bogert, David L. Microlubrication control. 4,467,892, Cl. 184-7.400.
van der Hardt Aberson, Frederik E. C.: *See*—
van Deursen, Petrus H.; and van der Hardt Aberson, Frederik E. C., 4,467,674, Cl. 74-867.000.
van der Hoek, Willem, to U.S. Philips Corporation. Optical telecommunication element. 4,468,088, Cl. 350-96.230.
van der Lely, Cornelis. Overload couplings. 4,467,663, Cl. 74-15.400.
Vander Meer, James C.; and Spink, Robert W., to Eaton Corporation. Load voltage-current displacement regulator motor control system. 4,468,603, Cl. 318-779.000.
van Deursen, Petrus H.; and van der Hardt Aberson, Frederik E. C., to Van Doorne's Transmissie B.V. Control of an infinitely variable transmission of a motor vehicle. 4,467,674, Cl. 74-867.000.
Van Deusen, Richard A.: *See*—
Paul, Prem S.; and Van Deusen, Richard A., 4,468,346, Cl. 260-112.00B.
Van Doorn, Cornelis Z.; and Lorteije, Jean H. J., to U.S. Philips Corporation. Matrix excitation circuit for an oscilloscope display screen comprising a liquid crystal. 4,468,661, Cl. 340-784.000.
Vandrilla, Steven. Candle assemblies employing a window sill locking leash. 4,468,721, Cl. 362-392.000.
van Maanen, Johannes D., to Tevopharm-Schiedam B.V. Method and apparatus for splicing packing material webs. 4,467,589, Cl. 53-450.000.
Van Noten, Lodewijk, to N.V. Raychem S.A. Wraparound closure. 4,468,536, Cl. 174-92.000.
Van Sickle, Dale E.; Newland, Gordon C.; Siirola, Jeffrey J.; and Cook, Steven L., to Eastman Kodak Company. Diketene chlorination method. 4,468,356, Cl. 260-544.00Y.
Van Vonno, N. W., to Harris Corporation. Dielectric isolation fabrication for laser trimming. 4,468,414, Cl. 427-53.100.
Varian Associates, Inc.: *See*—
Barger, Dale M., 4,468,643, Cl. 333-202.000.
Vasudevan, Asuri K.: *See*—
Byrne, Stephen C.; and Vasudevan, Asuri K., 4,468,298, Cl. 204-60.000.
Vazquez, Gonzalo; and Akkerman, Neil H., to AVA International, Inc. Flow controlling apparatus. 4,467,866, Cl. 166-117.500.
VDO Adolf Schindling AG: *See*—
Berryman, Walter H.; Manson, Peter J.; Hamley, Adrian H.; and Korb, Joseph, 4,467,646, Cl. 73-304.00C.
VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Wege, Regina, 4,467,721, Cl. 101-363.000.
VEB Mansfeld Kombinat Wilhelm Pieck: *See*—
Primke, Konrad; Papsdorf, Peter; Pohle, Gunther; and Trautmann, Klaus-Peter, 4,468,008, Cl. 266-99.000.
VEB Werkzeugmaschinenbau: *See*—
Haustein, Manfred, 4,467,564, Cl. 51-165.00R.
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Bruderreck, Hartmut; Deininger, Gunter; Gottlieb, Klaus; Wehmeier, Friedel-Heinrich; and Haselhorst, Manfred, 4,468,233, Cl. 44-56.000.
Vella, Peter J., to E. & J. Gallo Winery. Process for the reduction of alcohol content of beverages. 4,468,407, Cl. 426-592.000.
Venturini, Marco, to Texas Instruments Incorporated. Direct AC converter for converting a balanced AC polyphase input to an output voltage. 4,468,725, Cl. 363-160.000.
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Schabereiter, Heinz; and Tosch, Josef, 4,468,250, Cl. 75-128.00A.
Verhoeven, Leonardus A. J., to U.S. Philips Corporation. Device for and method of X-ray image processing. 4,468,697, Cl. 358-111.000.
Verma, Brahm P.; and Prussia, Stanley E., to University of Georgia Research Foundation, Inc. Apparatus for cracking edible nuts. 4,467,710, Cl. 99-571.000.
Versar Inc.: *See*—
Miessler, James D., 4,468,363, Cl. 264-128.000.
Vickers, Peter C.: *See*—
Smith, Ernest B.; Slabbert, Phillipus D.; Bout, Bernardus J.; and Vickers, Peter C., 4,467,895, Cl. 187-29.00R.
Victor Company of Japan, Ltd.: *See*—
Yaebashi, Toshio, 4,468,595, Cl. 318-254.000.
Villevielle, Jean L.: *See*—
Tandart, Pascal R.; and Villevielle, Jean L., 4,468,625, Cl. 328-139.000.
Virginia Adjustable Bed Manufacturing Corp.: *See*—
Schatz, Joshua G., 4,467,486, Cl. 5-508.000.

Vizard, David, to Shelburne Incorporated. Exhaust mufflers for internal combustion engines. 4,467,887, Cl. 181-265.000.
Vogel, Franz-Gunter: *See*—
Maubach, Gerd; and Vogel, Franz-Gunter, 4,467,889, Cl. 182-103.000.
Vogel, Martin: *See*—
Kowalski, Alexander; Vogel, Martin; and Blankenship, Robert M., 4,468,498, Cl. 525-301.000.
Vogelsberg, Dieter: *See*—
Feese, Wolfgang; and Vogelsberg, Dieter, 4,467,596, Cl. 57-293.000.
Voith, Katherine, to Ayerst, McKenna & Harrison, Inc. Combination of β-adrenoceptor antagonists and anxiolytic agents. 4,468,391, Cl. 424-244.000.
Volke, Hans-Werner; Hilkenmeier, Jurgen; Kohlhage, Hermann; and Tewes, Udo, to Nixdorf Computer AG. Device for the mounting of a printing head and for the mounting and guidance of an ink ribbon for a printer. 4,468,143, Cl. 400-248.000.
Volkmann, Robert A., to Pfizer Inc. Process for the preparation of biotin. 4,468,516, Cl. 548-154.000.
Vollmann, William, to Cordis Corporation. Multi-mode microprocessor-based programmable cardiac pacer. 4,467,810, Cl. 128-419.0PG.
Vollmar, Kurt: *See*—
Walther, Karl-Heinz; Vollmar, Kurt; and Dusch, Albert, 4,467,738, Cl. 112-129.000.
von Sichart, Frithjof: *See*—
Lechner, Robert; von Sichart, Frithjof; and Picard, Peter, 4,468,651, Cl. 340-347.0CC.
Vorbruggen, Helmut; Elger, Walter; Town, Michael-Harold; and Schillinger, Ekkehard, to Schering, Aktiengesellschaft. Prostaglandins and prostacyclins, processes for their preparation and their use as medicaments. 4,468,395, Cl. 424-246.000.
Voronkov, Mikhail G.; Platonova, Ada T.; Annenkova, Vladislava Z.; Annenkova, Valentina M.; Kazimirovskaya, Valentina B.; and Ugrjumova, Galina S. Oxysulfonic derivative of copolymer of acrolein and acrylic acid and direct action anticoagulant on its basis. 4,468,378, Cl. 424-81.000.
Vsesojuzny Nauchnoissledovatelsky Institut Ispolzovania Gaza V Narodnom Khozyaistve: *See*—
Kreinin, Efim V.; Smolkov, Anatoly N.; Iliin, Valentin A.; and Golyikh, Vladimir T., deceased, 4,467,779, Cl. 126-91.00A.
Vykumny ustav zuslechtovaci: *See*—
Dvorsky, Drahomir; and Cerovsky, Karel, 4,468,228, Cl. 8-188.000.
Vyshee Voennoe Tekhaicheskoe Uchilische Imeni N.E. Baumana: *See*—
Puryaev, Daniil T., 4,468,122, Cl. 356-360.000.
WABCO Ltd.: *See*—
Smith, Eric, 4,467,605, Cl. 60-577.000.
WABCO Westinghouse Compagnia Freni S.p.A.: *See*—
Casalone, Enrico, 4,467,704, Cl. 92-129.000.
Wagers, William D., Jr.: *See*—
Scott, Brian L.; and Wagers, William D., Jr., 4,468,204, Cl. 434-309.000.
Wagner, Howard G., to Machlett Laboratories, Incorporated, The. Pulsed X-ray tube motor. 4,468,598, Cl. 318-341.000.
Wainess, Anamac; and Wainess, William. Switch lock. 4,468,544, Cl. 200-42.00R.
Wainess, William: *See*—
Wainess, Anamac; and Wainess, William, 4,468,544, Cl. 200-42.00R.
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Fujiwara, Yoshiro; Kojima, Yuji; Yamada, Sumio; Hoshino, Hiroshi; and Wakatsuki, Noboru, 4,468,582, Cl. 310-312.000.
Wako, Shoji; and Todo, Hidemasa, to Fuji Xerox Co., Ltd. Electrostatic record image forming method. 4,468,681, Cl. 346-153.100.
Waldron, Curtis R. Animal mugger. 4,467,746, Cl. 119-99.000.
Waldrop, T. William: *See*—
Musser, Glenn A.; McDuffie, James W.; Pucher, Richard A.; Redding, Lloyd W.; and Waldrop, T. William, 4,467,590, Cl. 56-11.200.
Walker, Edward S.: *See*—
King, Harold B.; Lai, Ching C.; and Walker, Edward S., 4,468,163, Cl. 414-21.000.
Walker, John G., to Walker Wingsail Systems Limited. Sail arrangements. 4,467,741, Cl. 114-103.000.
Walker, Trevor: *See*—
Early, Allen D.; Cawlfield, David W.; Walker, Trevor; and Weisman, Paul T., 4,468,428, Cl. 428-221.000.
Walker, Wayman, II: *See*—
de Lappe, Brock W.; Risebrough, Robert W.; Walker, Wayman, II; and Colledge, Edwin H., 4,468,324, Cl. 210-350.000.
Walker Wingsail Systems Limited: *See*—
Walker, John G., 4,467,741, Cl. 114-103.000.
Wall, Arne E.: *See*—
Siwersson, Olle L.; and Wall, Arne E., 4,467,910, Cl. 198-518.000.
Wallace, Gerald L., to Wessel Company, The. Method and apparatus for producing pop-up booklets. 4,468,020, Cl. 270-5.000.
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., to Chicago Pneumatic Tool Company. Rotary and orbital sander. 4,467,565, Cl. 51-170.0MT.
Wallin, Ralf: *See*—
Rydquist, Jan E.; Sandberg, Lars; and Wallin, Ralf, 4,467,607, Cl. 60-602.000.
Walters, Jeffrey A.: *See*—
Burcher, Dennis S.; Dickson, David M.; and Walters, Jeffrey A., 4,468,701, Cl. 358-181.000.
Walther, Karl-Heinz; Vollmar, Kurt; and Dusch, Albert, to Pfaff Industriemaschinen GmbH. Detachable drive for sewing machine trimming knife. 4,467,738, Cl. 112-129.000.
Wang, Anthony D.; and Brumbaugh, Donald L., to Burr-Brown Research Corporation. Digital-to-analog converter having ladder network and improved interconnection therefor. 4,468,652, Cl. 340-347.0DA.
Wang, Chung C., to AT&T Bell Laboratories. Data structure and search method for a data base management system. 4,468,728, Cl. 364-200.000.
Wang, Hai C. H., to Wong Fok Kee Co., Ltd. Artificial Christmas tree for quick folding and display. 4,468,421, Cl. 428-8.000.
Wang, Shii-Shyong; and Chu, Ruey-Shi, to United States of America, Army. Self contained antenna test device. 4,468,669, Cl. 343-703.000.
Ward, Phillip W.: *See*—
Johnson, Charles R.; Ward, Phillip W.; Lindley, Joe H.; Maher, Robert A.; Holmes, Jerry D.; and Fuchser, Troy D., 4,468,793, Cl. 375-97.000.
Wargo, Alec. Device for cooling semi-conductors. 4,467,860, Cl. 165-80.00C.
Warlick, R. Patterson. Assembly for damping sea waves. 4,468,151, Cl. 405-27.000.
Warner-Lambert Company: *See*—
Deyloff, John L., 4,468,456, Cl. 435-36.000.
Warren, Bernard J.: *See*—
Beyland, Laurens S.; and Warren, Bernard J., 4,468,585, Cl. 313-318.000.
Warren, Brent K.: *See*—
Knaus, Edward E.; Warren, Brent K.; and Ondrus, Theodore A., 4,468,403, Cl. 424-267.000.
Warren, Toney C.; and Hance, Michael E., to Coastcom. Drop-and-insert multiplex digital communications system. 4,468,767, Cl. 370-55.000.
Warwick, Michael J., to WCB Plastics Limited. Storage container with removable lid. 4,467,939, Cl. 220-331.000.
Watanabe, Kazuo: *See*—
Makabe, Hachiro; Watanabe, Kazuo; and Takahashi, Yoshitaka, 4,467,740, Cl. 112-158.00E.
Watanabe, Keizo: *See*—
Miyata, Hiroyasu; Watanabe, Keizo; and Yamaguchi, Akio, 4,467,671, Cl. 74-10.850.
Watanabe, Noboru, to Toyota Jidosha Kabushiki Kaisha. Method and a system for controlling a soot catcher purging throttle valve. 4,467,601, Cl. 60-274.000.
Watanabe, Yukihiro, to Aisan Kogyo Kabushiki Kaisha. Start control device in fuel supply system for internal combustion engine. 4,467,748, Cl. 123-179.00G.
Waters, William M.; and Jarrett, Bobby R., to United States of America, Navy. Digital coherent detector. 4,468,794, Cl. 375-103.000.
Watson, James M.: *See*—
Butler, James R.; Watson, James M.; Kendall, Debra L.; and Mikkelson, Karen A., 4,468,343, Cl. 252-403.000.
Wavin B.V.: *See*—
Beune, Joannes H.; and de Putter, Warner Uan, 4,468,367, Cl. 264-255.000.
WCB Plastics Limited: *See*—
Warwick, Michael J., 4,467,939, Cl. 220-331.000.
Weasel, George E., Jr. Removable pallet floor for chilled vegetation transport. 4,467,612, Cl. 62-78.000.
Weaver, Charles A., to RCA Corporation. Apparatus for attaching a matrix to an electroforming device and method therefor. 4,468,290, Cl. 204-5.000.
Weber, Friedrich, to Maschinenfabrik Goebel GmbH. Pickup and deacceleration drive of a sheet conveyor. 4,468,021, Cl. 270-60.000.
Weber, Hans-Rudolf, to Niro Plan AG. Gas or electrically heated convection air oven for baking foods. 4,467,777, Cl. 126-21.00A.
Weber, Kurt: *See*—
Luthi, Christian; Meyer, Hans R.; and Weber, Kurt, 4,468,352, Cl. 260-459.00A.
Weber, Robert A.: *See*—
George, Dennis R.; Steinmetz, Michael J.; and Weber, Robert A., 4,468,219, Cl. 604-66.000.
Weber, Steve A.: *See*—
Sauerwein, William D.; Weber, Steve A.; and Dibbern, John E., Jr., 4,467,896, Cl. 188-69.000.
Weeks, Paul D.: *See*—
Pirie, Donald K.; and Weeks, Paul D., 4,468,351, Cl. 260-245.20R.
Weetman, Ronald J., to General Signal Corp. Mixing apparatus. 4,468,130, Cl. 366-330.000.
Wege, Regina, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Ink-applying device. 4,467,721, Cl. 101-363.000.
Wehmeier, Friedel-Heinrich: *See*—
Bruderreck, Hartmut; Deininger, Gunter; Gottlieb, Klaus; Wehmeier, Friedel-Heinrich; and Haselhorst, Manfred, 4,468,233, Cl. 44-56.000.
Weikel, Gary. Dental wedge. 4,468,199, Cl. 433-149.000.
Weinar, Roger N. Concealable wallboard fastener and walls and partitions assembled with the aid thereof. 4,467,578, Cl. 52-281.000.
Weinar, Roger N. Readily separable positively locking panel fasteners. 4,467,579, Cl. 52-281.000.
Weinberg, Kurt; and Johnson, Gordon C., to Union Carbide Corporation. Stabilization of polycondensation catalysts. 4,468,489, Cl. 524-136.000.
Weintz, Johann: *See*—
Braatz, Andreas; Weintz, Johann; and Kurz, Wolf-Dieter, 4,467,747, Cl. 123-41.120.

Weisman, Paul T.: *See*—
Early, Allen D.; Cawlfield, David W.; Walker, Trevor; and Weisman, Paul T., 4,468,428, Cl. 428-221.000.

Weiss, Leonard: *See*—
Lanier, Charles S.; Maxwell, Hiram M.; McKay, Roger E.; and Weiss, Leonard, 4,468,734, Cl. 364-200.000.

Weitz, Hans-Martin; and Fischer, Rolf, to BASF Aktiengesellschaft. Preparation of diacyloxyhexadienes from hexatrienes. 4,468,525, Cl. 560-244.000.

Wells, William M. Energy absorbing trailer chain. 4,467,598, Cl. 59-78.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Konersmann, Erhard, 4,467,567, Cl. 51-287.000.

Werner & Pfleiderer: *See*—
Hinger, Klaus-Jurgen, 4,468,256, Cl. 127-1.000.

Werth, Dee A.: *See*—
Brush, Robert W., Sr.; and Werth, Dee A., 4,468,077, Cl. 339-89.00M.

Wessel Company, The: *See*—
Wallace, Gerald L., 4,468,020, Cl. 270-5.000.

Wessel, Wolf: *See*—
Buck, Rainer; Kuttner, Thomas; and Wessel, Wolf, 4,467,775, Cl. 123-571.000.

West Electric Company, Ltd.: *See*—
Ogura, Hisashi; and Tanaka, Kazuo, 4,468,592, Cl. 315-241.00P.

Westbrook Greenhouses Limited: *See*—
Quist, Robert, 4,467,504, Cl. 24-462.000.

Westhead, William T., to Scapa Inc. Papermakers fabric using differential melt yarns. 4,467,839, Cl. 139-383.00A.

Westinghouse Electric Corp.: *See*—
McNab, Ian R.; and Kemeny, George A., 4,467,696, Cl. 89-8.000.

Wetherell, Ronald D.: *See*—
Lewison, Richard A., 4,467,875, Cl. 172-776.000.

Whaley, Mark D.: *See*—
Hansen, Stanley W.; Terleski, John D.; and Whaley, Mark D., 4,468,738, Cl. 364-200.000.

Wheel Developments Limited: *See*—
Gregg, John D. W., 4,467,496, Cl. 16-18.00B.

Wheeler, Robert G.: *See*—
Bhiwandiwala, Pouru; and Wheeler, Robert G., 4,467,806, Cl. 128-341.000.

Whirlpool Corporation: *See*—
Fish, Warren H.; and Sunnarborg, Robert P., 4,467,495, Cl. 15-354.000.
Platt, Clark I.; and Hageman, James R., 4,467,627, Cl. 68-17.00R.

White, Bruce W., to FMC Corporation. Pendant supported boom with fixed and live pendant portions. 4,467,928, Cl. 212-182.000.

White, David D., Jr.: *See*—
Booz, A. David; Barch, Daniel R.; Kuchera, Ray A.; and White, David D., Jr., 4,468,182, Cl. 425-7.000.

White, Dwain M.: *See*—
Holub, Fred; Floryan, Daniel E.; and White, Dwain M., 4,468,506, Cl. 525-432.000.

White Engineering Corporation: *See*—
White, Gerald W., 4,468,309, Cl. 204-192.00N.

White, Gerald W., to White Engineering Corporation. Method for resisting galling. 4,468,309, Cl. 204-192.00N.

Whiteside, Leo A., to Wright Manufacturing Company. Method and apparatus for shaping a proximal tibial surface. 4,467,801, Cl. 128-303.00R.

Wicki, Heinz, to Sandoz Ltd. Trisazo dyes having a 4-(1-amino-3,6-disulfo-8-hydroxy-7-phenylazonaphthyl-2-azo)phenylazo group linked to a coupling component radical. 4,468,348, Cl. 260-159.000.

Wicnienski, Michael F.; and Charles, Donald E., to Baxter Travenol Laboratories, Inc. Dosimeter for photometric applications. 4,468,562, Cl. 250-372.000.

Wieland, Gunter: *See*—
Schellberg, Franz; Kauffeisen, Bernard; Oberbach, Manfred; Zingel, Gerhard; and Wieland, Gunter, 4,468,780, Cl. 373-75.000.

Wier, Jan H. Wire tensioning apparatus. 4,468,015, Cl. 267-71.000.

Wiese, John R.: *See*—
Clauss, Harry G.; and Wiese, John R., 4,468,009, Cl. 266-99.000.

Wiggins, Richard H., Jr.; and Brantingham, George L., to Texas Instruments Incorporated. Variable frame length data converter for a speech synthesis circuit. 4,468,805, Cl. 381-51.000.

Wiklund, Gordon M.: *See*—
Meal, John R.; and Wiklund, Gordon M., 4,468,069, Cl. 339-6.00A.

Wilburg, Jerry D.: *See*—
Lawrence, Gary N.; and Wilburg, Jerry [illegible], 4,468,1[illegible], Cl. 431-89.000.

Wild, Karl: *See*—
Kaiser, Hans; Winterhalter, Walter; Wild, Karl; and Gruner, Peter, 4,467,723, Cl. 102-240.000.

Wildman, John R.: *See*—
Kuna, Wayne A.; and Wildman, John R., 4,467,557, Cl. 446-463.000.

Wilkinson, Harlen E.; and Sopher, Theodore, to American Can Company. Warp resistant closure for sanitary cans. 4,467,933, Cl. 220-66.000.

Willbanks, Charles E., to Milliken Research Corporation. Low flow constant rate pump. 4,468,220, Cl. 604-133.000.

Williams, Albert L.: *See*—
Chen, Catherine S. H.; and Williams, Albert L., 4,468,335, Cl. 252-8.55D.

Williams, Dennis L. Regulated high torque flexible bladed wind wheel. 4,468,169, Cl. 416-119.000.

Williams, John B.: *See*—
Le, Tri C.; Meyer, Danny S.; and Williams, John B., 4,468,039, Cl. 277-112.000.

Williamson, Charles A. Modular barrel fuel injection apparatus. 4,467,772, Cl. 123-506.000.

Willigman, John; and Wojtanek, Guy A., to Singer Company, The. Timer drive mechanism. 4,467,664, Cl. 74-116.000.

Wilson, David A.: *See*—
Crump, Druce K.; and Wilson, David A., 4,468,252, Cl. 106-90.000.

Wilson, William L. Torque transfer apparatus. 4,467,603, Cl. 60-369.000.

Wimmer, Otto. Centrifuge. 4,468,215, Cl. 494-48.000.

Winckler, Wilhelm: *See*—
Bohn, Hans; and Winckler, Wilhelm, 4,468,345, Cl. 260-112.00R.

Winterhalter, Walter: *See*—
Kaiser, Hans; Winterhalter, Walter; Wild, Karl; and Gruner, Peter, 4,467,723, Cl. 102-240.000.

Wirostko, Emil: *See*—
Johnson, Lewis A.; and Wirostko, Emil, 4,468,398, Cl. 424-250.000.

Wiseman, Robert F. Pegboard spacer. 4,467,990, Cl. 248-220.300.

Wismer, Marco; and Bosso, Joseph F., to PPG Industries, Inc. Method of cationic electrodeposition. 4,468,307, Cl. 204-181.00C.

Wissmann, Michael, to Robert Bosch GmbH. Fuel injection system. 4,467,766, Cl. 123-454.000.

Witt, Leonard; and Witt, Mary L. Anti-recoil arrangement. 4,467,697, Cl. 89-37.0GM.

Witt, Mary L.: *See*—
Witt, Leonard; and Witt, Mary L., 4,467,697, Cl. 89-37.0GM.

Witte, Karl H., to Maschinen Witte KG. Shaping mold. 4,468,190, Cl. 425-392.000.

Wittmann, Heinz; and Svoboda, Josef, to TMC Corporation. Safety ski binding. 4,468,048, Cl. 280-614.000.

Wittrock, Michael C., to Eversman Mfg. Company, The. Tine and tine and hub assembly. 4,467,874, Cl. 172-548.000.

Wojtanek, Guy A.: *See*—
Willigman, John; and Wojtanek, Guy A., 4,467,664, Cl. 74-116.000.

Wolff, Douglas F.: *See*—
Blanchard, Russell O.; Wolff, Douglas F.; Steele, Charles E.; and Molloy, Richard P., deceased, 4,467,569, Cl. 52-9.000.

Wolter, Alphonse F.: *See*—
Ruff, Stanley; Wolter, Alphonse F.; and Torrence, Arthur, 4,467,524, Cl. 30-2.000.

Wong Fok Kee Co., Ltd.: *See*—
Wang, Hai C. H., 4,468,421, Cl. 428-8.000.

Woodings, Robert T. Method of normalizing sucker rods using a normalizing unloader. 4,468,261, Cl. 148-154.000.

Woods, Lonnie K.; and Hamilton, James M. Computer optimized adaptive suspension system. 4,468,050, Cl. 280-707.000.

Woods, Lonnie K.; and Hamilton, James M. Computer optimized adaptive suspension system having combined shock absorber/air spring unit. 4,468,739, Cl. 364-424.000.

Woods, Richard E.; and Bradburn, Marvin D. Vehicle compactor. 4,467,716, Cl. 100-45.000.

Woods, Richard E.: *See*—
Somers, Rex E.; Beasey, Ray A.; and Woods, Richard E., 4,467,572, Cl. 52-70.000.

Woodstream Corporation: *See*—
Green, Milton J., 4,468,270, Cl. 156-189.000.

Wozniak, Walter J.: *See*—
Terzian, Rouben T.; Herbstler, Horst D.; and Wozniak, Walter J., 4,467,555, Cl. 446-158.000.

Wray, William R.; and Burkhardt, James, to Polaroid Corporation. Synchronizable oscillator. 4,468,637, Cl. 331-143.000.

Wright Co. Inc., The: *See*—
Nasfell, Jack W., Jr., 4,467,693, Cl. 84-329.000.

Wright, John J.: *See*—
Rane, Dinanath F.; Wright, John J.; and Pike, Russell E., 4,468,404, Cl. 424-269.000.

Wright Manufacturing Company: *See*—
Whiteside, Leo A., 4,467,801, Cl. 128-303.00R.

Wu, Han-Chou. Sit-up exercise apparatus. 4,468,022, Cl. 272-93.000.

Wydler, Robert: *See*—
Bloch, Peter; Wydler, Robert; and Gunter, Erwin J., 4,467,568, Cl. 51-287.000.

Xerox Corporation: *See*—
Pels, Susan J.; and Schaeffer, Donald W., 4,468,114, Cl. 355-14.00R.
Stoffel, James C.; Hsing, To R.; and Tandon, Jagdish C., 4,468,704, Cl. 358-282.000.

Yabe Optical Inst. Mfg. Co., Ltd.: *See*—
Yabe, Shinji, 4,468,107, Cl. 354-286.000.

Yabe, Shinji, to Yabe Optical Inst. Mfg. Co., Ltd. Macro-focussing rear converter lens. 4,468,107, Cl. 354-286.000.

Yaebashi, Toshio, to Victor Company of Japan, Ltd. Driving circuit for a Hall motor. 4,468,595, Cl. 318-254.000.

Yamada, Hiromitsu: *See*—
Mori, Shunji; Yamada, Hiromitsu; Takeuchi, Kunihiko; and Do, Michihisa, 4,468,808, Cl. 382-20.000.

Yamada, Kouzi: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Kuwana, Noriaki; Abe, Shinya; and Yamada, Kouzi, 4,468,458, Cl. 435-134.000.

Yamada, Mitsuhiko; Nishida, Tukasa; and Inoue, Toshifumi, to Dainippon Screen Seizo Kabushiki Kaisha. Method for varying colors of a picture image, displayed in a color display, for reproducing a color printed matter. 4,468,692, Cl. 358-76.000.

Yamada, Sumio: *See*—
Fujiwara, Yoshiro; Kojima, Yuji; Yamada, Sumio; Hoshino, Hiroshi; and Wakatsuki, Noboru, 4,468,582, Cl. 310-312.000.

Yamada, Susumu: *See*—
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Yamada, Yutaka: *See*—
Isogai, Kiyoshi; Koga, Ituo; Yamada, Yutaka; and Haruta, Kazumi, 4,467,750, Cl. 123-188.00M.

Yamagata, Ryutaro; Kozuka, Nobuhiko; Nishihama, Hitoshi; Koyama, Shigeo; and Sakai, Kazutada, to Mita Industrial Company Limited. Developing device for use on an electrostatic copying apparatus. 4,468,111, Cl. 355-3.0DD.

Yamaguchi, Akio: *See*—
Miyata, Hiroyasu; Watanabe, Keizo; and Yamaguchi, Akio, 4,467,671, Cl. 74-10.850.

Yamaki, Mitsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Composite cooking apparatus. 4,468,548, Cl. 219-10.470.

Yamamoto, Kaichi: *See*—
Hashimoto, Yoshitaka; Yamamoto, Kaichi; and Shirota, Norihisa, 4,468,710, Cl. 360-9.100.

Yamamoto, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Cold pressing method. 4,467,953, Cl. 228-116.000.

Yamamoto, Toshiyoshi, to Sanshukakan Kogyo Kabushiki Kaisha. Screw press dehydrator provided with cake cutter. 4,467,717, Cl. 100-117.000.

Yamane, Kiyoshi E.; Thomas, Timothy C.; and Tostado, Jose J., to Kaiser Aerospace & Electronics Corporation. Direct reading tank gauge. 4,467,647, Cl. 73-321.000.

Yamatsu, Isao: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,468,459, Cl. 435-136.000.

Yamauchi, Hiroshi: *See*—
Machida, Yoshimasa; Saito, Isao; Sugiyama, Isao; Negi, Shigeto; Nomoto, Seiichiro; Ikuta, Hironori; Yamauchi, Hiroshi; and Kitoh, Kyosuke, 4,468,394, Cl. 424-246.000.

Yamaura, Tatsuo: *See*—
Hikida, Chuichi; Yamaura, Tatsuo; and Nomura, Yuuzi, 4,468,589, Cl. 313-496.000.

Yamazoe, Hisamitsu: *See*—
Arimura, Takashi; Yamazoe, Hisamitsu; and Matsumura, Toshimi, 4,467,770, Cl. 123-489.000.

Yang, Kang; and Reedy, James D., to Conoco Inc. Color precursor removal from detergent alkyl benzenes. 4,468,476, Cl. 502-83.000.

Yang, Yung-hsiung: *See*—
Tominaga, Michiaki; Yang, Yung-hsiung; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,468,402, Cl. 424-258.000.

Yardley, James T.: *See*—
Gupta, Arunava; and Yardley, James T., 4,468,474, Cl. 502-5.000.

Yasuki, Shigeru: *See*—
Katsumata, Haruo; Matsuya, Takeshi; Saitoh, Hitoshi; Yasuki, Shigeru; Sato, Yukio; Osaki, Masaru; Komeno, Minoru; Arai, Takayuki; Ochi, Shigeki; and Ino, Tatsuo, 4,468,171, Cl. 417-53.000.

Yasuoka, Hirotoshi, to Mitsubishi Denki Kabushiki Kaisha. Swiveling apparatus having installed electric cables. 4,468,070, Cl. 339-7.000.

Ydrefors, Axel: *See*—
Karlsson, Ingemar; Svensson, Percyval; Nelenius, Eric; Svensson, Goran; Ydrefors, Axel; and Lindstrom, Bengt, 4,467,950, Cl. 226-91.000.

Yeakey, Ernest L.; and Cuscurida, Michael, to Texaco Inc. Aromatic polyester polycarbonates from polyols derived from recycled polyethylene terephthalate. 4,468,483, Cl. 521-172.000.

Yock, Lewis M.; and Burdick, Jack B., to Globe Machine Manufacturing Company. Apparatus for effecting clarification of liquid provided with filter cleaning means. 4,468,325, Cl. 210-408.000.

Yoder, Ronald L., to Universal Consolidated Methods, Inc. Vibratory finishing apparatus. 4,467,563, Cl. 51-163.100.

Yokoyama, Nobuo; and Araki, Yoshihiko, to Nippon Oil Co., Ltd. Wax emulsion. 4,468,254, Cl. 106-271.000.

Yonehata, Yuzuru: *See*—
Miura, Azusa; Kambara, Kesao; Kinoshita, Takashi; Suzuki, Toshio; and Yonehata, Yuzuru, 4,468,572, Cl. 307-69.000.

Yoneyama, Koichi: *See*—
Takematsu, Tetsuo; Konnai, Makoto; Omokawa, Hiroyoshi; Yoneyama, Koichi; Ushinohama, Kazuyuki; and Suzuki, Seiichi, 4,468,245, Cl. 71-88.000.

Yoshida, Akio, to Toyota Jidosha Kogyo Kabushiki Kaisha. System for reducing vibration in a vehicle provided with an internal combustion engine. 4,468,207, Cl. 464-65.000.

Yoshida Kogyo K. K.: *See*—
Tsubata, Noritaka, 4,467,840, Cl. 139-384.00B.

Yoshida, Nobuyuki: *See*—
Takahashi, Shigeyuki; Yoshida, Nobuyuki; and Kobayashi, Masahiro, 4,467,622, Cl. 62-354.000.

Yoshii, Yuji: *See*—
Hiraga, Masaharu; Mabe, Atsushi; and Yoshii, Yuji, 4,468,178, Cl. 417-440.000.

Yoshikoshi, Hideyuki: *See*—
Tajima, Osamu; Matsui, Seiji; Yoshikoshi, Hideyuki; Miyashita, Tsuneo; and Nakayama, Michio, 4,468,253, Cl. 106-97.000.

Yoshimoto, Teruo: *See*—
Murakami, Shinichi; Sugitani, Junichi; and Yoshimoto, Teruo, 4,467,654, Cl. 73-640.000.

Yoshimura, Mistuo; and Takaoka, Akihisa, to Nippon Oil Seal Industry Co., Ltd. Backup ring for hydraulic apparatus seals. 4,468,041, Cl. 277-144.000.

Yoshitake, Hiroshi: *See*—
Kataoka, Yushin; Matsuda, Masaaki; Yoshitake, Hiroshi; and Hirose, Yoshikazu, 4,468,374, Cl. 423-112.000.

Yoshiwa, Masao; Hujioka, Yoshiro; Tokai, Masakuni; and Muro, Mikio, to Ministry of International Trade and Industry of Japan. Solar-heating system. 4,467,958, Cl. 237-2.00B.

Yoshizaki, Tsutomu, to Fujitsu Limited. Testing equipment for electric components. 4,468,616, Cl. 324-158.00F.

Young, David E.; and Boyes, David H., to Protectair Limited. Fracture cast braces. 4,467,792, Cl. 128-88.000.

Young, Harlan S.: *See*—
Hatchadoorian, Edward; Ostapchenko, George J.; and Young, Harlan S., 4,468,426, Cl. 428-213.000.

Youngs, Wilbur R.: *See*—
Crites, Robert C.; and Youngs, Wilbur R., 4,467,584, Cl. 52-727.000.

Yukimoto, Kazuyoshi; Mori, Keiji; and Masuda, Mitsuyoshi, to Aisin Seiki Kabushiki Kaisha. Drive mechanism for a vehicle sunroof. 4,468,063, Cl. 296-223.000.

Yunick, Henry, to MotorTech, Inc. Internal combustion engine. 4,467,752, Cl. 123-193.00P.

Yuniskis, Donald G., Jr.: *See*—
Dunn, Thomas J.; Yuniskis, Donald G., Jr.; Szakacs, Gabor L.; and Nguyen, Nghia V., 4,468,743, Cl. 364-520.000.

Yuto, Masao: *See*—
Shimba, Hiroshi; Suzuki, Fumio; and Yuto, Masao, 4,468,435, Cl. 428-383.000.

Zaderej, Andrew. Motor starting circuit. 4,468,604, Cl. 318-786.000.

Zahir, Sheik A.; and Eldin, Sameer H., to Ciba-Geigy Corporation. Alkenylphenyl substituted acrylates or methacrylates. 4,468,524, Cl. 560-221.000.

Zalesak, Joseph F.; and Rogers, Peter H., to United States of America, Navy. Directional line-hydrophone array calibrator. 4,468,760, Cl. 367-13.000.

Zampini, Anthony; and Malon, Raymond F., to Monsanto Company. Cross-linked polyphenylene oxide. 4,468,501, Cl. 525-390.000.

Zampini, Anthony; and Malon, Raymond F., to Monsanto Company. Amino ketone cross-linked polyphenylene oxide. 4,468,503, Cl. 525-390.000.

Zampini, Anthony: *See*—
Malon, Raymond F.; and Zampini, Anthony, 4,468,500, Cl. 525-390.000.
Malon, Raymond F.; and Zampini, Anthony, 4,468,502, Cl. 525-390.000.

Zampini, Louis, Jr., to American Tourister, Inc. Combination lock. 4,467,628, Cl. 70-312.000.

Zander, Hans-Hermann, to Siemens Aktiengesellschaft. System for generating a speed-proportional voltage. 4,468,618, Cl. 324-165.000.

Zellweger, Conrad: *See*—
Rochat, Jean-Denis; and Zellweger, Conrad, 4,467,834, Cl. 137-637.000.

Zengel, Hans G.: *See*—
Eisenhuth, Ludwig; Zengel, Hans G.; and Bergfeld, Manfred, 4,468,526, Cl. 564-76.000.

Zenith Electronics Corporation: *See*—
Midland, Richard W., 4,468,690, Cl. 358-67.000.
Reno, James J., Jr., 4,468,715, Cl. 361-186.000.

Zeya, Hasan I., to Immunomed Corp. Method and apparatus for producing a microscopic specimen slide. 4,468,410, Cl. 427-2.000.

Zhukov, Leonid F.; Chugunny, Evgeny G.; and Shumikhin, Vladimir S., to Institut Problem Litya Akademii Nauk Ukrainskoi SSR. Light-guide unit for transmitting thermal radiation from molten metal to pyrometer. 4,468,771, Cl. 374-131.000.

Zinylek, Theodore, Jr. Device for clamping fire hoses and the like. 4,467,997, Cl. 251-7.000.

Zingel, Gerhard: *See*—
Schellberg, Franz; Kauffeisen, Bernard; Oberbach, Manfred; Zingel, Gerhard; and Wieland, Gunter, 4,468,780, Cl. 373-75.000.

Zodrow, Rudolf, to Jagenberg AG. Machine for labeling and/or filling bottles along two paths. 4,467,847, Cl. 141-98.000.

Zollner, Dieter H.: *See*—
Bauer, Hanns G.; Zollner, Dieter H.; Otto, Josef; Muhlenbeck, Josef; Rittmann, Friedrich; Conradty, Claudio; Lauterbach-Dammler, Inge; and Sonke, Horst, 4,468,783, Cl. 373-93.000.

Zwiener, Rudolf, to Aktiengesellschaft Adolf Saurer. Clamping jaw arrangement of a thread clamp for textile yarns or the like. 4,467,841, Cl. 139-429.000.

Zytkovicz, Duane J., to Medtronic, Inc. Tool for creating a pocket for a epidural electrode. 4,467,800, Cl. 128-303.00R.

103100 Canada Inc.: *See*—
Donaldson, Edward; and Frisk, Kenneth A. A., 4,467,818, Cl. 130-27.00T.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF AUGUST, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abe, Ryoji: *See*—
Hataishi, Osamu; Momma, Yoshinobu; and Abe, Ryoji, Re. 31,652, Cl. 29-571.000.

Aidlin Automation Corp.: *See*—
Aidlin, Stephen H.; and Tartakowsky, Michael, Re. 31,655, Cl. 414-662.000.

Aidlin, Stephen H.; and Tartakowsky, Michael, to Aidlin Automation Corp. Machine and method for vertical transportation of containers. Re. 31,655, Cl. 414-662.000.

Fasco, Rudolph. Anchor. Re. 31,654, Cl. 114-297.000.

Fujitsu Limited: *See*—
Hataishi, Osamu; Momma, Yoshinobu; and Abe, Ryoji, Re. 31,652, Cl. 29-571.000.

Hataishi, Osamu; Momma, Yoshinobu; and Abe, Ryoji, to Fujitsu Limited. Method of producing a semiconductor device. Re. 31,652, Cl. 29-571.000.

Momma, Yoshinobu: *See*—
Hataishi, Osamu; Momma, Yoshinobu; and Abe, Ryoji, Re. 31,652, Cl. 29-571.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Takeuchi, Chifumi, Re. 31,653, Cl. 84-1.210.

Takeuchi, Chifumi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of the harmonic synthesis type. Re. 31,653, Cl. 84-1.210.

Tartakowsky, Michael: *See*—
Aidlin, Stephen H.; and Tartakowsky, Michael, Re. 31,655, Cl. 414-662.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Beecher, Gary R.: *See*—
Stewart, Kent K.; Beecher, Gary R.; and Hare, Peter E., B1 4,013,413, Cl. 436-53.000.

Canon Kabushiki Kaisha: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, B1 4,017,170, Cl. 355-3.00R.

Hare, Peter E.: *See*—
Stewart, Kent K.; Beecher, Gary R.; and Hare, Peter E., B1 4,013,413, Cl. 436-53.000.

Hattori, Hiroyuki: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, B1 4,017,170, Cl. 355-3.00R.

Hughes, Richard H.; and Marks, Bruce G., to RCA Corporation. Color picture tube having an improved inline electron gun with an expanded focus lens. B1 4,370,592, 8-28-84, Cl. 313-414.000.

Iida, Toshihide: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, B1 4,017,170, Cl. 355-3.00R.

Klemm, Gerhard. Device for intermittent feeding of webs. B1 4,249,688, 8-28-84, Cl. 226-24.000.

Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Electrophotographic device. B1 4,017,170, 8-28-84, Cl. 355-3.00R.

Marks, Bruce G.: *See*—
Hughes, Richard H.; and Marks, Bruce G., B1 4,370,592, Cl. 313-414.000.

Miyamoto, Koichi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, B1 4,017,170, Cl. 355-3.00R.

North, Bernard F., to Sun Chemical Corporation. Treating cellulose textile fabrics with dimethylol dihydroxyethyleneurea-polyol. B1 4,396,391, 8-28-84, Cl. 8-181.000.

RCA Corporation: *See*—
Hughes, Richard H.; and Marks, Bruce G., B1 4,370,592, Cl. 313-414.000.

Rhone-Poulenc Agrochemie: *See*—
Theissen, Robert J., B1 3,776,715, Cl. 71-111.000.

Sakamaki, Hisashi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, B1 4,017,170, Cl. 355-3.00R.

Stewart, Kent K.; Beecher, Gary R.; and Hare, Peter E., to United States of America, Agriculture. Apparatus and method for rapid analyses of plurality of samples. B1 4,013,413, 8-28-84, Cl. 436-53.000.

Sun Chemical Corporation: *See*—
North, Bernard F., B1 4,396,391, Cl. 8-181.000.

Theissen, Robert J., to Rhone-Poulenc Agrochemie. Halophenoxy benzoic acid herbicides. B1 3,776,715, 8-28-84, Cl. 71-111.000.

Umezawa, Kazumi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, B1 4,017,170, Cl. 355-3.00R.

United States of America
Agriculture: *See*—
Stewart, Kent K.; Beecher, Gary R.; and Hare, Peter E., B1 4,013,413, Cl. 436-53.000.

White, Ralph B. Free arm sewing machine cabinet mounting mechanism. B1 4,274,686, 8-28-84, Cl. 312-27.000.

LIST OF DESIGN PATENTEES

A/S Platon: *See*—
Bergsland, Jon, 275,326, Cl. D25-94.000.

Above Water Mfg.: *See*—
Wegener, Joseph B., II, 275,264, Cl. D8-373.000.

Adams, Steve D., Jr. Telephone. 275,280, 8-28-84, Cl. D14-53.000.

Adams, Steve D., Jr. Telephone. 275,281, 8-28-84, Cl. D14-53.000.

Adams, Steve D., Jr. Telephone. 275,282, 8-28-84, Cl. D14-53.000.

Albrecht, Frank E. Emergency entrance tool. 275,258, 8-28-84, Cl. D8-17.000.

Allen, C. Wayne: *See*—
Halcomb, F. Joseph, III; and Allen, C. Wayne, 275,320, Cl. D24-26.000.

Allibert S.A.: *See*—
Deconinck, Didier, 275,249, Cl. D6-436.000.

Amba Marketing Systems: *See*—
Schimmel, Otto K., 275,241, Cl. D3-48.000.

Ametek, Inc.: *See*—
Cutler, Morris, 275,263, Cl. D8-358.000.

Angesco, Inc.: *See*—
Bossinas, Leslie H., 275,272, Cl. D12-96.000.
Automation Industries, Inc.: *See*—
Williams, James; and Wills, Henry K., 275,333, Cl. D32-31.000.
Aztec Machinery Company: *See*—
Rattner, David, 275,257, Cl. D7-387.000.
Bacon, Lawrence D., to Western Design Corporation. Cupola for cannon. 275,304, 8-28-84, Cl. D22-3.000.
Barbo, Brian C.; Klein, Richard L.; Kahute, Robert M.; and Hendrickson, Thomas N., to CPAC, Inc. Control console for ion exchange unit that regenerates photographic developers. 275,277, 8-28-84, Cl. D13-12.000.
Beck, Martin J., to Ion Systems, Inc. Combined air ionizer and cleaner. 275,317, 8-28-84, Cl. D23-149.000.
Bell & Howell Company: *See*—
Wells, Jon B.; Fidler, Lamar M.; Westover, Dwight G.; Loosen, Ronald E.; and Smith, Charles M., 275,284, Cl. D14-104.000.
Bergsland, Jon, to A/S Platon. Protective sheet for a foundation wall, a floor or the like. 275,326, 8-28-84, Cl. D25-94.000.
Bianchi International: *See*—
Nichols, Richard D. E., 275,305, Cl. D22-13.000.
Bloom, David H.: *See*—
Cless, Gerhard; Castellanos, Rafael A.; Eischen, Albert L.; and Bloom, David H., 275,286, Cl. D14-111.000.
Bossinas, Leslie H., to Angesco, Inc. Track tractor. 275,272, 8-28-84, Cl. D12-96.000.
Bouman, Mark H., to Century Mfg. Co. Welding machine. 275,292, 8-28-84, Cl. D15-144.000.
Bouman, Mark H., to Century Mfg. Co. Welding machine. 275,293, 8-28-84, Cl. D15-144.000.
Box Vester R., Sr. Football tee. 275,303, 8-28-84, Cl. D21-209.000.
Boyer, Kenneth J., to Clenaglass Electric Limited. Machine for washing glasses. 275,332, 8-28-84, Cl. D32-2.000.
Breidenstein, Charles J.: *See*—
Littlefield, Bruce G.; Caplan, Jerome S.; and Breidenstein, Charles J., 275,279, Cl. D13-24.000.
Bridgestone Tire Company Limited: *See*—
Kojima, Hiroshi; Nishio, Hideaki; and Yamaguchi, Koujiro, 275,274, Cl. D12-147.000.
Brio Toy AB: *See*—
Petersson, Nils A. I.; and Sander, Nils B. L., 275,299, Cl. D21-76.000.
Brookes, Malcolm J.: *See*—
Heinzelman, Bert D.; Spranger, Douglas M.; Brookes, Malcolm J.; and Kuphal, John E., 275,321, Cl. D24-34.000.
Bryant, Quintealya W. Hair clip holder. 275,330, 8-28-84, Cl. D28-75.000.
Buchanan, Charles W., to Sornborger, William E. Corner bracket for picture frame or the like. 275,251, 8-28-84, Cl. D6-300.000.
Caplan, Jerome S.: *See*—
Littlefield, Bruce G.; Caplan, Jerome S.; and Breidenstein, Charles J., 275,279, Cl. D13-24.000.
Castellanos, Rafael A.: *See*—
Cless, Gerhard; Castellanos, Rafael A.; Eischen, Albert L.; and Bloom, David H., 275,286, Cl. D14-111.000.
Century Mfg. Co.: *See*—
Bouman, Mark H., 275,292, Cl. D15-144.000.
Bouman, Mark H., 275,293, Cl. D15-144.000.
Child, Francis W. Animal ear tag insecticide dispenser. 275,331, 8-28-84, Cl. D30-99.000.
Chino, Takashi: *See*—
Nakao, Shinroku; Chino, Takashi; and Tokutake, Katuhiro, 275,322, Cl. D24-36.000.
Clenaglass Electric Limited: *See*—
Boyer, Kenneth J., 275,332, Cl. D32-2.000.
Cless, Gerhard; Castellanos, Rafael A.; Eischen, Albert L.; and Bloom, David H., to Data Specialties, Inc. Printer. 275,286, 8-28-84, Cl. D14-111.000.
Cliff, John O.: *See*—
Edwards, James M.; and Cliff, John O., 275,306, Cl. D23-2.000.
Edwards, James M.; and Cliff, John O., 275,307, Cl. D23-2.000.
Edwards, James M.; and Cliff, John O., 275,308, Cl. D23-2.000.
Clivio, Franco; and Raffler, Dieter, to Gardena Kress & Kastner GmbH. Pop-up sprinkler. 275,313, 8-28-84, Cl. D23-7.000.
Cloud, C. Carey. Puzzle. 275,301, 8-28-84, Cl. D21-105.000.
Combi Co., Ltd.: *See*—
Nakao, Shinroku; Chino, Takashi; and Tokutake, Katuhiro, 275,322, Cl. D24-36.000.
Cornell, Larry L. Plumbing fitting. 275,314, 8-28-84, Cl. D23-40.000.
CPAC, Inc.: *See*—
Barbo, Brian C.; Klein, Richard L.; Kahute, Robert M.; and Hendrickson, Thomas N., 275,277, Cl. D13-12.000.
Crowder, Thomas E. Hammer. 275,261, 8-28-84, Cl. D8-75.000.
Cutler, Morris, to Ametek, Inc. Cord reel. 275,263, 8-28-84, Cl. D8-358.000.
Data Specialties, Inc.: *See*—
Cless, Gerhard; Castellanos, Rafael A.; Eischen, Albert L.; and Bloom, David H., 275,286, Cl. D14-111.000.
Davies, Norman; and Vaill, Ronald E., to Westinghouse Electric Corp. Metal clad switchgear. 275,278, 8-28-84, Cl. D13-40.000.
Deconinck, Didier, to Allibert S.A. Cocktail table. 275,249, 8-28-84, Cl. D6-436.000.
Dooley, Thomas E.: *See*—
Young, Robert G.; Morton, Edward W.; Skwirut, Henry; and Dooley, Thomas E., 275,327, Cl. D26-3.000.
Drag Specialties, Inc.: *See*—
Rudd, Thomas H.; Stahel, Alwin J.; and Preisler, James M., 275,276, Cl. D12-182.000.
Dunlap, Jerald V., to M-D & Co. Portable air compressor. 275,291, 8-28-84, Cl. D15-9.000.
Durand, Philippe J. Tumbler or similar article. 275,252, 8-28-84, Cl. D7-6.000.
Durand, Philippe J. Mug or similar article. 275,253, 8-28-84, Cl. D7-9.000.
Durand, Philippe J. Tumbler or similar article. 275,254, 8-28-84, Cl. D7-14.000.
Durand, Philippe J. Bowl. 275,255, 8-28-84, Cl. D7-28.000.
Edwards, James M.; and Cliff, John O., to Pittsburgh-Des Moines Corporation. Combined water storage tank and building. 275,306, 8-28-84, Cl. D23-2.000.
Edwards, James M.; and Cliff, John O., to Pittsburgh-Des Moines Corporation. Combined water storage tank and building. 275,307, 8-28-84, Cl. D23-2.000.
Edwards, James M.; and Cliff, John O., to Pittsburgh-Des Moines Corporation. Combined water storage tank and building. 275,308, 8-28-84, Cl. D23-2.000.
Eischen, Albert L.: *See*—
Cless, Gerhard; Castellanos, Rafael A.; Eischen, Albert L.; and Bloom, David H., 275,286, Cl. D14-111.000.
Ensar Corporation: *See*—
Sarnoff, Norton; and Fletcher, Carl R., 275,315, Cl. D23-42.000.
Epson Corporation: *See*—
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Ferguson, Arthur R.; and Stevens, Myron T., to Outboard Marine Corporation. Mounting bracket assembly for an outboard motor. 275,289, 8-28-84, Cl. D15-4.000.
Ferguson, Arthur R.; and Stevens, Myron T., to Outboard Marine Corporation. Mounting bracket assembly for an outboard motor. 275,290, 8-28-84, Cl. D15-4.000.
Fidler, Lamar M.: *See*—
Wells, Jon B.; Fidler, Lamar M.; Westover, Dwight G.; Loosen, Ronald E.; and Smith, Charles M., 275,284, Cl. D14-104.000.
Fisons Limited: *See*—
Molloy, James O.; and Sydenham, Peter E., 275,268, Cl. D10-81.000.
Fletcher, Carl R.: *See*—
Sarnoff, Norton; and Fletcher, Carl R., 275,315, Cl. D23-42.000.
Foga System International AB: *See*—
Wahlin, Olof B., 275,324, Cl. D25-74.000.
Fredrich Thomas Industries, Inc.: *See*—
Wolfe, Henry S., 275,311, Cl. D23-3.000.
Gardena Kress & Kastner GmbH: *See*—
Clivio, Franco; and Raffler, Dieter, 275,313, Cl. D23-7.000.
Gautier, Raoul L., to Societe Generale des Eaux Minerales de Vittel. Bottle. 275,267, 8-28-84, Cl. D9-406.000.
Gevers, Hubert F. Microfiche. 275,295, 8-28-84, Cl. D16-26.000.
Gilliam, Deana. Taco holder. 275,256, 8-28-84, Cl. D7-76.000.
Giuliano, Joseph. Comb. 275,329, 8-28-84, Cl. D28-30.000.
Gould Inc.: *See*—
Juhola, David W.; Johns, David B.; and Kunimi, Yuri, 275,287, Cl. D14-113.000.
Gustavsson, Erik. Roof panel. 275,325, 8-28-84, Cl. D25-80.000.
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195 A 4,467,753
195 H 4,467,754
4,467,755
197 AC 4,467,756
198 DB 4,467,757
198 F 4,467,758
263 4,467,759
308 4,467,760
339 4,467,761
357 4,467,762
414 4,467,763
416 4,467,764
419 4,467,765
454 4,467,766
467 4,467,767
472 4,467,768
489 4,467,769
4,467,770
490 4,467,771
506 4,467,772
549 4,467,773
568 4,467,774
571 4,467,775
609 4,467,776

CLASS 126

21 A 4,467,777
77 4,467,778
91 A 4,467,779
110 R 4,467,780
201 4,467,781
299 D 4,467,782
378 4,467,783
384 4,467,784
400 4,467,785
415 4,467,786
425 4,467,787
433 4,467,788

CLASS 127

1 4,468,256

CLASS 128

1 D 4,467,790
1 R 4,467,789
20 4,467,791
88 4,467,792
92 BC 4,467,793
4,467,794
201.25 4,467,795
202.13 4,467,796
204.26 4,467,797
205.26 4,467,798
206.14 4,467,799
303 R 4,467,800
4,467,801
321 4,467,802
325 4,467,803
334 C 4,467,804
4,467,805
341 4,467,806
419 F 4,467,808
4,467,809
419 PG 4,467,807
4,467,810
635 4,467,811
664 4,467,812
702 4,467,813
738 4,467,814
740 4,467,815
756 4,467,816
786 4,467,817

CLASS 130

27 JT 4,467,819
27 T 4,467,818

CLASS 131

276 4,467,820

CLASS 132

40 4,467,821
84 B 4,467,822

CLASS 134

22.13 4,468,257

CLASS 137

15 4,467,823
74 4,467,824
112 4,467,825
188 4,467,826
197 4,467,827
484.4 4,467,828
561 A 4,467,829
590 4,467,830
625.27 4,467,831
625.47 4,467,832
637 4,467,833
4,467,834

CLASS 138

93 4,467,835
4,467,836
119 4,467,837

CLASS 139

305 4,467,838
383 A 4,467,839
384 B 4,467,840
429 4,467,841

CLASS 140

124 4,467,842

CLASS 141

1 4,467,843
4,467,844
10 4,467,845
47 4,467,846
98 4,467,847

CLASS 144

4 4,467,848
34 R 4,467,849
368 4,467,850

CLASS 145

2 R 4,467,851

CLASS 148

1.5 4,468,258
4,468,259
4,468,260
154 4,468,261
156 4,468,262

CLASS 149

22 4,468,263

CLASS 152

158 4,467,852

CLASS 156

62.2 4,468,264
64 4,468,265
131 4,468,266
132 4,468,267
159 4,468,268
175 4,468,269
189 4,468,270
220 4,468,271
280 4,468,272
286 4,468,273
320 4,468,274
401 4,468,275
510 4,468,276
567 4,468,277
610 4,468,278
617 SP 4,468,279
624 4,468,280
4,468,281
633 4,468,282
642 4,468,283
643 4,468,284
4,468,285

CLASS 160

133 4,467,853
135 4,467,854

CLASS 162

17 4,468,286
358 4,468,287

CLASS 164

7.1 4,467,855
47 4,467,856
253 4,467,857
360 4,467,858

CLASS 165

57 4,467,859
80 C 4,467,860
104.22 4,467,861
4,467,862
136 4,467,863

CLASS 166

96 4,467,864
102 4,467,865
117.5 4,467,866
188 4,467,867
263 4,467,868
273 4,467,869
321 4,467,870
369 4,467,871

CLASS 172

126 4,467,872
370 4,467,873
548 4,467,874
776 4,467,875
870 4,467,876

CLASS 173

12 4,467,877

CLASS 174

65 R 4,468,535
92 4,468,536

CLASS 175

4.6 4,467,878
325 4,467,879

CLASS 177

25 4,467,880
50 4,467,881
58 4,467,882
210 FP 4,467,883

CLASS 179

2 EA 4,468,538
4,468,539
4,468,540
18 B 4,468,528
18 BA 4,468,529
84 C 4,468,541
115.5 PV 4,468,530

CLASS 180

90 4,467,884
140 4,467,885
197 4,467,886

CLASS 181

265 4,467,887

CLASS 182

19 4,467,888
103 4,467,889
206 4,467,890
210 4,467,891

CLASS 184

7.4 4,467,892

CLASS 187

9 R 4,467,893
17 4,467,894
29 R 4,467,895

CLASS 188

69 4,467,896
73.38 4,467,897
73.44 4,467,898
320 4,467,899

CLASS 192

13 R 4,467,900
52 4,467,901
56 R 4,467,902
58 B 4,467,903
98 4,467,904
106.2 4,467,905

CLASS 198

368 4,467,907
441 4,467,908
481 4,467,909
518 4,467,910
648 4,467,911
650 4,467,912
687 4,467,913
705 4,467,906
861 4,467,914

CLASS 200

5 A 4,468,542
19 DR 4,468,543
42 R 4,468,544
50 AA 4,468,531
61.64 4,468,545
81.9 R 4,468,532
84 B 4,468,546
153 SC 4,468,533
294 4,468,547

CLASS 201

41 4,468,288

CLASS 204

1 T 4,468,289
5 4,468,290
13 4,468,291
27 4,468,292
4,468,293
4,468,294
33 4,468,295
47 4,468,296
59 R 4,468,297
60 4,468,298
4,468,299
4,468,300
98 4,468,301
108 4,468,302
109 4,468,303
129.6 4,468,304
130 4,468,305
180 P 4,468,306
181 C 4,468,307
192 N 4,468,309
192 R 4,468,308
197 4,468,310
252 4,468,311
284 4,468,312
298 4,468,313

CLASS 206

219 4,467,915
410 4,467,916
412 4,467,917
430 4,467,918
455 4,467,919
457 4,467,920
524.4 4,467,921
597 4,467,922
602 4,467,923

CLASS 208

8 R 4,468,314
10 4,468,315
59 4,468,316

CLASS 209

5 4,468,317

CLASS 210

96.1 4,468,318
97 4,468,319
4,468,320
232 4,468,321
236 4,468,322
350 4,468,324
408 4,468,325
619 4,468,326
626 4,468,327
634 4,468,328
651 4,468,329
656 4,468,330
659 4,468,331
755 4,468,332
776 4,468,323
798 4,468,333

CLASS 211

1.5 4,467,924
60 T 4,467,925
106 4,467,926
153 4,467,927

CLASS 212

182 4,467,928

CLASS 215

1 C 4,467,929
32 4,467,930
237 4,467,931

CLASS 219

10.47 4,468,548
10.77 4,468,549
51 4,468,553
56 4,468,550
121 EC 4,468,552
121 L 4,468,551
121 LG 4,468,534
4,468,554
4,468,555
523 4,468,556
535 4,468,557

CLASS 220

18 4,467,932
66 4,467,933
85 H 4,467,934
214 4,467,935
246 4,467,936
4,467,937
270 4,467,938
331 4,467,939
345 4,467,940

CLASS 222

1 4,467,941
44 4,467,942
309 4,467,943

CLASS 224

42.42 4,467,944
160 4,467,945
252 4,467,946
253 4,467,947

CLASS 225

97 4,467,948

CLASS 226

24 B1 4,249,688
45 4,467,949
91 4,467,950

CLASS 227

48 4,467,951
123 4,467,952

CLASS 228

116 4,467,953
117 4,467,954
119 4,467,955

CLASS 236

49 4,467,956
96 4,467,957

CLASS 237

2 B 4,467,958
55 4,467,959
4,467,960

CLASS 239

1 4,467,961
4,467,962
90 4,467,963
312 4,467,964
464 4,467,965
533.4 4,467,966
662 4,467,967
703 4,467,968

CLASS 241

101 B 4,467,969
101.2 4,467,970
215 4,467,971

CLASS 242

4 R 4,467,972
7.08 4,467,973
55.53 4,467,974
67.3 R 4,467,976
72 B 4,467,977
86.52 4,467,978
96 4,467,979
107.4 A 4,467,981
107.4 B 4,467,980
107.6 4,467,982
195 4,467,983
564 4,467,975

CLASS 244

78 4,467,984
135 R 4,467,985
147 4,467,986

CLASS 248

68.1 4,467,987
4,467,988
97 4,467,989
220.3 4,467,990
447.1 4,467,991
659 4,467,992

CLASS 249

28 4,467,993
144 4,467,994
160 4,467,995

CLASS 250

253 4,468,558
303 4,468,559
311 4,468,560
345 4,468,561
372 4,468,562
396 ML 4,468,563
427 4,468,564
491.1 4,468,565
492.2 4,468,566
577 4,468,567

CLASS 251

1 A 4,467,996
7 4,467,997
58 4,467,998
61.1 4,467,999
84 4,468,000
86 4,468,001
335 B 4,468,002

CLASS 252

8.5 C 4,468,334
8.55 D 4,468,335
62 4,468,336
67 4,468,337
75 4,468,339
105 4,468,338
299.63 4,468,340
301.23 4,468,341
353 4,468,342
403 4,468,343

CLASS 254

134.3 FT 4,468,003
325 4,468,004
350 4,468,005
389 4,468,006

CLASS 260

112 B 4,468,346
112 R 4,468,344
4,468,345
147 4,468,347
159 4,468,348
205 4,468,349
245.2 R 4,468,351
245.2 T 4,468,350
459 A 4,468,352
465.4 4,468,353
465.7 4,468,354
502.4 R 4,468,355
544 Y 4,468,356

CLASS 261

29 4,468,357
91 4,468,358

CLASS 264

82 4,468,359
83 4,468,360
119 4,468,361
127 4,468,362
128 4,468,363
176 R 4,468,364
177 R 4,468,365
4,468,366
255 4,468,367
530 4,468,368
560 4,468,369

CLASS 266

48 4,468,007
99 4,468,008
4,468,009
123 4,468,010
149 4,468,011
220 4,468,012
272 4,468,013

CLASS 267

47 4,468,014
71 4,468,015
141 4,468,016

CLASS 269

21 4,468,017
54.5 4,468,018
56 4,468,019

CLASS 270

5 4,468,020
60 4,468,021

CLASS 272

93 4,468,022
94 4,468,023
104 4,468,024
120 4,468,025
136 4,468,026

CLASS 273

1.5 R 4,468,027
85 R 4,468,028
108 4,468,029
109 4,468,030
110 4,468,031
148 A 4,468,032
153 S 4,468,033
183 D 4,468,034
243 4,468,035
271 4,468,036
295 4,468,037
422 4,468,038

CLASS 277

112 4,468,039
140 4,468,040
144 4,468,041
188 A 4,468,042
235 B 4,468,043
4,468,044

CLASS 280

11.3 4,468,045
416 4,468,046
419 4,468,047
614 4,468,048
634 4,468,049
707 4,468,050
751 4,468,051
784 4,468,052

CLASS 281

31 4,468,053

CLASS 285

137 R 4,468,054
141 4,468,055
281 4,468,056
373 4,468,057

CLASS 290

1 R 4,468,568
4,468,569
52 4,468,570

CLASS 292

144 4,468,058
337 4,468,059

CLASS 296

1 S 4,468,060
24 C 4,468,061
97 G 4,468,062
223 4,468,063
224 4,468,064

CLASS 298

23 R 4,468,065

CLASS 307

66 4,468,571
69 4,468,572
113 4,468,573
451 4,468,574
481 4,468,575
4,468,576

CLASS 308

187 4,468,066

CLASS 310

105 4,468,577
198 4,468,578
208 4,468,579
237 4,468,580
312 4,468,582
316 4,468,581
328 4,468,583
370 4,468,584

CLASS 312

27 B1 4,274,686
140 4,468,067
333 4,468,068

CLASS 313

318 4,468,585
336 4,468,586
413 4,468,587
414 B1 4,370,592
417 4,468,588
496 4,468,589
573 4,468,590
594 4,468,591

CLASS 315

241 P 4,468,592
371 4,468,593

CLASS 318

130 4,468,594
254 4,468,595
287 4,468,596
317 4,468,597
341 4,468,598
362 4,468,599
452 4,468,600
696 4,468,601
4,468,602
779 4,468,603
786 4,468,604

CLASS 320

36 4,468,605
61 4,468,606

CLASS 323

354 4,468,607

CLASS 324

51 4,468,608
61 QS 4,468,609
61 R 4,468,610
4,468,611
66 4,468,612
71.2 4,468,613
78 D 4,468,614
158 F 4,468,616
158 P 4,468,615
165 4,468,617
4,468,618
220 4,468,619
261 4,468,620
309 4,468,621
319 4,468,622
367 4,468,623

CLASS 328

55 4,468,624
139 4,468,625

CLASS 330

10 4,468,626
107 4,468,627
258 4,468,628
260 4,468,629
267 4,468,630
284 4,468,631

CLASS 331

14 4,468,632
56 4,468,633
60 4,468,634
107 S 4,468,635
113 R 4,468,636
143 4,468,637
178 4,468,638

CLASS 333

153 4,468,639
166 4,468,640
4,468,641
193 4,468,642
202 4,468,643
205 4,468,644

CLASS 335

42 4,468,645
216 4,468,646
262 4,468,647
295 4,468,648
4,468,649

CLASS 339

6 A 4,468,069
7 4,468,070
50 C 4,468,071
74 R 4,468,072
4,468,073
75 M 4,468,075
4,468,076
75 N 4,468,074
89 M 4,468,077
90 R 4,468,078
97 P 4,468,079
136 R 4,468,080
176 M 4,468,081
4,468,082
252 P 4,468,083

CLASS 340

58 4,468,650
347 CC 4,468,651
347 DA 4,468,652
4,468,653
4,468,654
518 4,468,655
539 4,468,656
555 4,468,657
567 4,468,658
719 4,468,659
764 4,468,660
784 4,468,661
789 4,468,662

815.27 4,468,663
825.69 4,468,664
856 4,468,665
870.29 4,468,666

CLASS 343

379 4,468,667
389 4,468,668
703 4,468,669
727 4,468,670
766 4,468,671
783 4,468,672
785 4,468,673
815 4,468,674
828 4,468,675

CLASS 346

76 PH 4,468,676
107 R 4,468,677
139 R 4,468,678
140 R 4,468,679
4,468,680
153.1 4,468,681

CLASS 350

96.11 4,468,084
96.14 4,468,085
4,468,086
96.18 4,468,087
96.23 4,468,088
4,468,089
96.30 4,468,090
4,468,091
128 4,468,092
162.12 4,468,093
299 4,468,094
319 4,468,095
427 4,468,096
4,468,097
4,468,098
454 4,468,099
463 4,468,100
538 4,468,101
581 4,468,102

CLASS 351

158 4,468,103
206 4,468,104

CLASS 353

66 4,468,105

CLASS 354

137 4,468,106
286 4,468,107
293 4,468,108
442 4,468,109

CLASS 355

3 DD 4,468,111
3 R B1 4,017,170
3 TR 4,468,110
14 D 4,468,112
14 R 4,468,114
14 TR 4,468,113
22 4,468,115
54 4,468,116

CLASS 356

73.1 4,468,117
4,468,118
152 4,468,119
237 4,468,120
328 4,468,121
360 4,468,122
404 4,468,123
411 4,468,124

CLASS 357

22 4,468,682
23 4,468,683
24 4,468,684
30 4,468,685
53 4,468,686

CLASS 358

19 4,468,687
22 4,468,688
31 4,468,689
67 4,468,690
73 4,468,691
76 4,468,692
78 4,468,693
93 4,468,694
101 4,468,695
111 4,468,696
4,468,697
4,468,698
148 4,468,699
181 4,468,701
228 4,468,700
245 4,468,702
282 4,468,703
4,468,704
284 4,468,705
300 4,468,706
4,468,707
310 4,468,708
322 4,468,709

CLASS 360

9.1 4,468,710
96.3 4,468,711
106 4,468,712
130.21 4,468,713

CLASS 361

62 4,468,714
186 4,468,715
333 4,468,716
382 4,468,717
399 4,468,718
433 4,468,719

CLASS 362

281 4,468,720
392 4,468,721

CLASS 363

71 4,468,722
82 4,468,723
88 4,468,724
160 4,468,725
161 4,468,726

CLASS 364

200 4,468,727
4,468,728
4,468,729
4,468,730
4,468,731
4,468,732
4,468,733
4,468,734
4,468,735
4,468,736
4,468,737
4,468,738
424 4,468,739
426 4,468,740
474 4,468,741
497 4,468,742
520 4,468,743
527 4,468,744
559 4,468,745
569 4,468,746
577 4,468,747
748 4,468,748
861 4,468,749
900 4,468,750
4,468,751
4,468,752
4,468,753
4,468,754
4,468,755
4,468,756

CLASS 365

12 4,468,757
15 4,468,758
201 4,468,759

CLASS 366

8 4,468,125
87 4,468,126
150 4,468,127
156 4,468,128
213 4,468,129
330 4,468,130

CLASS 367

13 4,468,760
43 4,468,761
83 4,468,762
136 4,468,763

CLASS 368

69 4,468,131
76 4,468,132
156 4,468,133
309 4,468,134

CLASS 369

77.2 4,468,764

CLASS 370

1 4,468,765
3 4,468,766
55 4,468,767

CLASS 371

16 4,468,768
37 4,468,769
42 4,468,770

CLASS 372

8 4,468,772
32 4,468,773
34 4,468,774
92 4,468,775
93 4,468,776
107 4,468,777
108 4,468,778

CLASS 373

36 4,468,779
75 4,468,780
84 4,468,781
4,468,782
93 4,468,783

CLASS 374

44 4,468,135
45 4,468,136
131 4,468,771
160 4,468,137

CLASS 375

1 4,468,784
4 4,468,785
11 4,468,786
17 4,468,787
23 4,468,788
25 4,468,789
30 4,468,790
45 4,468,792
87 4,468,791
97 4,468,793
103 4,468,794

CLASS 377

6 4,468,795
28 4,468,796
52 4,468,797
57 4,468,798

CLASS 378

35 4,468,799
131 4,468,800
132 4,468,801
140 4,468,802
181 4,468,803

CLASS 381

15 4,468,537
47 4,468,804
51 4,468,805
123 4,468,806

CLASS 382

2 4,468,807
20 4,468,808
50 4,468,809

CLASS 383

3 4,468,810
5 4,468,811
108 4,468,812

CLASS 384

303 4,468,138

CLASS 400

120 4,468,139
124 4,468,140
4,468,141
4,468,142
248 4,468,143
354 4,468,144
496 4,468,145

CLASS 401

88 4,468,146
292 4,468,147

CLASS 403

259 4,468,148
316 4,468,149

CLASS 405

7 4,468,150
27 4,468,151
61 4,468,152
78 4,468,153
128 4,468,154
170 4,468,155
222 4,468,156
224 4,468,157

CLASS 408

16 4,468,158
56 4,468,159

CLASS 409

202 4,468,160

CLASS 411

171 4,468,161

CLASS 414

4 4,468,162
21 4,468,163
165 4,468,164
417 4,468,165
662 Re.31,655
690 4,468,166

CLASS 415

1 4,468,167
116 4,468,168

CLASS 416

119 4,468,169

CLASS 417

44 4,468,170
53 4,468,171
151 4,468,172
220 4,468,173
238 4,468,174
394 4,468,175
406 4,468,176
413 4,468,177
440 4,468,178
462 4,468,179

CLASS 418

15 4,468,180
55 4,468,181

CLASS 420

463 4,468,370

CLASS 422

102 4,468,371
124 4,468,372

CLASS 423

54 4,468,373
112 4,468,374
122 4,468,375
358 4,468,376
474 4,468,377

CLASS 424

81 4,468,378
101 4,468,379
114 4,468,380
158 4,468,381
177 4,468,382
4,468,383
180 4,468,384
4,468,385
181 4,468,386
211 4,468,387
4,468,388
215 4,468,389
232 4,468,390
244 4,468,391
4,468,392
245 4,468,393
246 4,468,394
4,468,395
4,468,396
248.51 4,468,397
250 4,468,398
251 4,468,399
256 4,468,400
258 4,468,401
4,468,402
267 4,468,403
269 4,468,404
274 4,468,520
322 4,468,405

CLASS 425

7 4,468,182
4,468,183
73 4,468,184
133.1 4,468,185
294 4,468,186
363 4,468,187
371 4,468,188
391 4,468,189
392 4,468,190
564 4,468,191

CLASS 426

231 4,468,406
592 4,468,407
604 4,468,408
659 4,468,409

CLASS 427

2 4,468,410
8 4,468,411
38 4,468,412
39 4,468,413
53.1 4,468,414
91 4,468,415
126.5 4,468,416
156 4,468,417
208.2 4,468,418
266 4,468,419
397.7 4,468,420

CLASS 428

8 4,468,421
57 4,468,422
72 4,468,423
103 4,468,424
172 4,468,425
213 4,468,426
220 4,468,427
221 4,468,428
283 4,468,429
291 4,468,430
317.7 4,468,431
328 4,468,432
372 4,468,433
4,468,434
383 4,468,435
423.3 4,468,436
553 4,468,437
692 4,468,438

CLASS 429

1 4,468,439
8 4,468,440
105 4,468,441

CLASS 430

30 4,468,442
60 4,468,443
72 4,468,444
107 4,468,445
138 4,468,446
197 4,468,447
222 4,468,448
4,468,449
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223 4,468,452
269 4,468,453
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20 4,468,192
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30 4,468,197
63 4,468,198
149 4,468,199
174 4,468,200
176 4,468,201
199 4,468,202

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228 4,468,203
309 4,468,204

CLASS 435

3 4,468,455
36 4,468,456
69 4,468,457
134 4,468,458
136 4,468,459
240 4,468,460
253 4,468,461
4,468,462
316 4,468,463
317 4,468,464

CLASS 436

53 B1 4,013,413
64 4,468,465
86 4,468,466
97 4,468,467
173 4,468,468
500 4,468,469
539 4,468,470

CLASS 441

5 4,468,205

CLASS 446

15 4,467,552
136 4,467,553
158 4,467,555
230 4,467,556
242 4,467,554
463 4,467,557

CLASS 455

38 4,468,813
159 4,468,814

CLASS 464

37 4,468,206
65 4,468,207
117 4,468,208
180 4,468,209

CLASS 474

170 4,468,210
205 4,468,211

CLASS 493

52 4,468,212
213 4,468,213
310 4,468,214

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CLASS 501

135 4,468,471
137 4,468,472
155 4,468,473

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CLASS 536

7.1 4,468,511
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CLASS 544

027 4,468,514

CLASS 548

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154 4,468,516
189 4,468,517
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409 4,468,519

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153 4,468,222
199 4,468,223
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248 4,468,225
321 4,468,226
327 4,468,227

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D2—	361	275,240
	378.2	275,239
D3—	48	275,241
D6—	300	275,251
	316	275,248
	360	275,242
	364	275,243
	373	275,244
	430	275,250
	436	275,249
	462	275,245
	521	275,246
	553	275,247
D7—	6	275,252
	9	275,253
	14	275,254
	28	275,255
	76	275,256
	387	275,257
D8—	17	275,258
	50	275,259
	51	275,260
	75	275,261
	356	275,262
	358	275,263
	373	275,264
	382	275,265
	383	275,266
D9—	406	275,267
D10—	81	275,268
D11—	121	275,269
D12—	12	275,270
		275,271
	96	275,272
	111	275,273
	147	275,274
	157	275,275
	182	275,276
D13—	12	275,277
	24	275,279
	40	275,278
D14—	53	275,280
		275,281
		275,282
	90	275,283
	104	275,284
	106	275,285
	111	275,286
	113	275,287
D15—	1	275,288
	4	275,289
		275,290
	9	275,291
	144	275,292
		275,293
D16—	2	275,294
	26	275,295
D18—	12	275,296
D19—	49	275,297
	62	275,298
D21—	76	275,299
	77	275,300
	105	275,301
	198	275,302
	209	275,303
D22—	3	275,304
	13	275,305
D23—	2	275,306
		275,307
		275,308
	3	275,309
		275,310
		275,311
	4	275,312
	7	275,313
	40	275,314
	42	275,315
	44	275,316
	149	275,317
D24—	1.1	275,318
		275,319
	26	275,320
	34	275,321
	36	275,322
D25—	59	275,323
	74	275,324
	80	275,325
	94	275,326
D26—	3	275,327
	38	275,328
D28—	30	275,329
	75	275,330
D30—	99	275,331
D32—	2	275,332
	31	275,333

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01 :	4,468,341		4,468,080		4,468,667		4,468,066		4,468,031		4,468,577
	4,468,549		4,468,083		4,468,669		4,468,159		4,468,054		4,468,784
04 :	4,467,585		4,468,103		4,468,686		4,468,217		4,468,064	20 :	4,467,850
	4,467,645		4,468,117		4,468,688		4,468,372		4,468,069		4,467,914
	4,467,693		4,468,124		4,468,708		4,468,410		4,468,135		4,467,955
	4,467,715		4,468,134		4,468,739		4,468,414		4,468,145	21 :	4,467,543
	4,467,759		4,468,149		4,468,742		4,468,440		4,468,227		4,467,609
	4,467,984		4,468,157		4,468,767		4,468,605		4,468,249		4,467,928
	4,468,030		4,468,166		4,468,773		4,468,633		4,468,328		4,468,409
	4,468,074		4,468,170		4,468,787		4,468,638		4,468,373		4,468,423
	4,468,357		4,468,172	08 :	4,467,874		4,468,705		4,468,431		4,468,457
	4,468,652		4,468,199		4,468,046		4,468,734		4,468,562	22 :	4,467,489
06 :	4,467,475		4,468,212		4,467,528		4,468,760		4,468,598		4,467,501
	4,467,478		4,468,221		4,468,542		4,468,786		4,468,600		4,467,787
	4,467,479		4,468,222		4,468,730	13 :	4,467,498		4,468,601		4,467,864
	4,467,480		4,468,224		4,468,738		4,467,500		4,468,602		4,468,379
	4,467,482		4,468,235	09 :	4,467,525		4,467,552		4,468,612		4,468,546
	4,467,485		4,468,246		4,467,640		4,467,617		4,468,626	23 :	4,467,915
	4,467,492		4,468,247		4,467,812		4,467,710		4,468,690		4,468,585
	4,467,503		4,468,248		4,467,860		4,467,839		4,468,715	24 :	4,467,581
	4,467,542		4,468,263		4,467,907		4,467,969		4,468,728		4,467,639
	4,467,599		4,468,268		4,467,954		4,468,115		4,468,737		4,467,799
	4,467,615		4,468,269		4,468,017		4,468,118	18 :	4,467,562		4,467,896
	4,467,630		4,468,280		4,468,079		4,468,229		4,467,563		4,468,091
	4,467,644		4,468,281		4,468,105		4,468,317		4,467,572		4,468,093
	4,467,647		4,468,282		4,468,119		4,468,336		4,467,638		4,468,136
	4,467,658		4,468,284		4,468,293		4,468,751		4,467,661		4,468,383
	4,467,688		4,468,285		4,468,306	16 :	4,467,959		4,467,716		4,468,534
	4,467,691		4,468,297		4,468,351		4,467,962		4,467,893		4,468,766
	4,467,692		4,468,310		4,468,408		4,468,061		4,467,931		4,468,785
	4,467,698		4,468,324		4,468,516	17 :	4,467,499		4,467,998		4,468,789
	4,467,744		4,468,338		4,468,531		4,467,512		4,468,027		4,468,794
	4,467,756		4,468,371		4,468,623		4,467,515		4,468,058		4,013,413
	4,467,772		4,468,407		4,468,678		4,467,530		4,468,290	25 :	4,467,521
	4,467,786		4,468,424		4,468,680		4,467,532		4,468,380		4,467,545
	4,467,803		4,468,445		4,468,691		4,467,540		4,468,399		4,467,610
	4,467,823		4,468,462		4,468,714		4,467,555		4,468,401		4,467,614
	4,467,828		4,468,464		4,468,721		4,467,557		4,468,469		4,467,687
	4,467,831		4,468,484		4,468,726		4,467,588		4,468,511		4,467,773
	4,467,838		4,468,497	10 :	4,468,331		4,467,664		4,468,512		4,467,783
	4,467,857		4,468,507		4,468,426		4,467,678		4,468,513		4,467,791
	4,467,932		4,468,544		4,468,433		4,467,689		4,468,514		4,467,960
	4,467,941		4,468,557		4,468,756		4,467,697		4,468,517		4,468,073
	4,467,985		4,468,610	12 :	Re.31,654		4,467,724		4,468,604		4,468,177
	4,467,989		4,468,611		4,467,476		4,467,789		4,468,701		4,468,216
	4,467,990		4,468,629		4,467,548		4,467,844		4,468,788		4,468,279
	4,467,994		4,468,636		4,467,742		4,467,863		4,274,686		4,468,283
	4,468,034		4,468,639		4,467,743		4,467,900	19 :	4,467,643		4,468,322
	4,468,043		4,468,643		4,467,746		4,467,927		4,467,712		4,468,382
	4,468,050		4,468,653		4,467,752		4,467,930		4,467,875		4,468,448
	4,468,060		4,468,654		4,467,810		4,467,933		4,467,876		4,468,450
	4,468,072		4,468,657		4,467,817		4,467,987		4,468,346		4,468,451
	4,468,076		4,468,658		4,467,944		4,468,029		4,468,417		4,468,553

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